VOL. 160 — NO. 2

JANUARY 14, 1961

Telephony

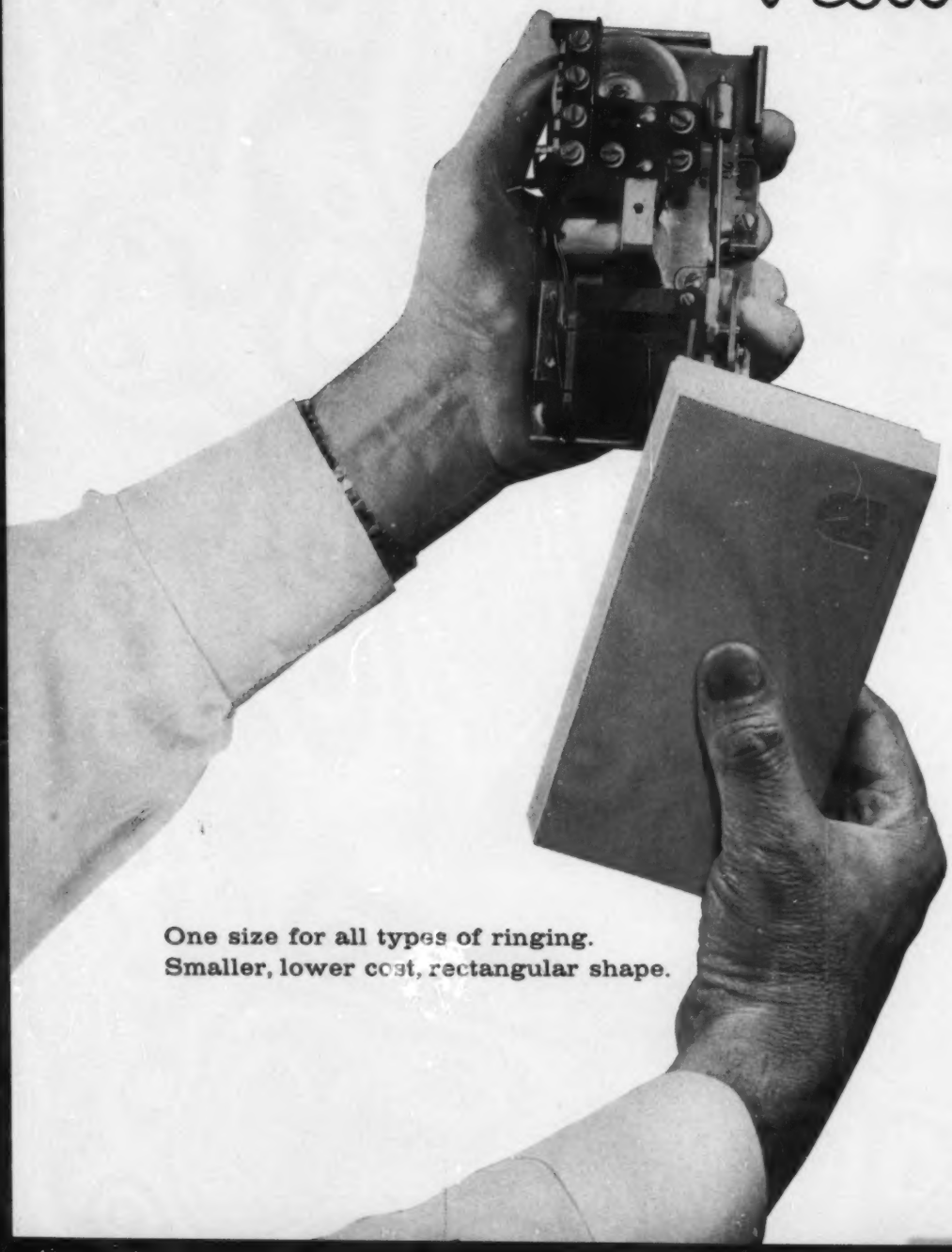
THE JOURNAL OF THE TELEPHONE INDUSTRY

Mrs. Claire Chock beams as Lt. Governor James K. Kealoha crowns her "Starlite" queen in Hawaii. Mrs. Chock is a service representative with Hawaiian Telephone Company, and is aiding in promotion of the Starlite instrument.

Circulation This Issue
14,119, of Which
13,556 Is Paid

MANAGEMENT · PLANT · TRAFFIC · COMMERCIAL · LEGAL · ACCOUNTING

Why buy a jumbo ringer for a Petite phone ?



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This compact unit handles straight-line, all types of frequency ringing; it even provides tube space for superimposed ringing. If your requirement is for frequency ringing, this specially-designed PETITE* ringer is by far the smallest in the entire industry . . . rugged . . . dependable . . . miniaturized.

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With thousands and thousands of PETITE phones already in service from coast to coast, telephone men are proving that the new Stromberg-Carlson PETITE is truly the most desirable and—for them—the most profitable. Independents have accepted this design at the fastest rate in history. PETITE is the perfect extension for any room in any home; ideal as a main station, too. The ringer, in soft blue beige, is modern single gong with 3-position tone switch.

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T.M. Reg.

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A DIVISION OF **GENERAL DYNAMICS**

FLASHES AND PLUGS

GUY WITHOUT A GUY. The retirement recently of a veteran woman telephone operator from her tour of service with the Rutland County Telephone & Telegraph Co., Wallingford, Vt., recalled sundry incidents connected with the company's nearly-60-year history.

There was the time when Mrs. James "Grandma" Perry of Danby, who closed her telephone career in December, was almost overwhelmed by the flood of calls. This occurred in November, 1959, when five men were trapped by fire in the Vermont Marble Co.'s Danby quarry, and anxious relatives kept the wires hot with their calls. Mrs. Perry's daughter was on duty with her at the time, and both were nearly exhausted when the emergency was over.

"Grandma's" husband, too, chuckled over the time 25 years ago when a local farmer needed wire to guy his silo, and cut off about 150 feet of telephone wire. The Rutland County company had to send out trouble shooters, who discovered what had happened when service was impaired. Said Mr. Perry, "As I remember it, the farmer got quite a bawling out."

•

'TWAS A WIZARD IN THE BLIZZARD. A New York Department of Sanitation employe was deluged with telephone calls during the city's recent blizzard. He picked up the telephone one day to hear a voice say:

"This is Governor Rockefeller. I would like to thank you for helping me out this morning."

"Sure, sure, you're the governor," said the skeptical employe.

"No, really, this is Governor Rockefeller," persisted the voice. "You may think I'm kidding, but I do want to thank you."

Probably shaking his head, the sanitation man hung up the telephone. He later learned that this was an "on-the-level" call, and that the governor actually wanted to thank the department's men for freeing his car from a snow drift in front of the governor's town house on Fifth Avenue.

•

HEP NUMBER FOR REAL WORRIERS. To the subscriber, the telephone industry symbolizes service, so much so that some subscribers are ready and willing to adapt the versatile telephone to almost any task. For example, now that federal tax experts from the Bureau of Internal Revenue are seasonally available to guide harassed taxpayers in filing their returns, in many communities, there will be tax information telephones that will be very busy, indeed.

One New York taxpayer, doubtless having his own bouts with the figures, suggests that the telephone company arrange a "dial for trouble" service, and appropriately, he suggests a three-letter number, such as WOE-1313.

CHANGE OF ADDRESS

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

1901 — 60 years — 1961

January 14, 1961

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Published every week on Saturday by TELEPHONY PUBLISHING CORP., 608 S. Dearborn St., Chicago 5, Ill. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879. 30c per copy (except special issues—50c). Subscription $4.50, 1-year; $7.00, 2-years; $9.00, 3-years. Add $1.00 per year for postage to Canada and Pan American countries; $2.00 per year to Foreign countries. Telephone WAbash 2-2435.

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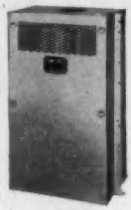
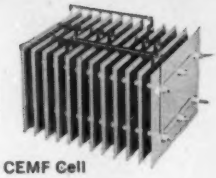


Decimonic Converter

Dual Flotrol



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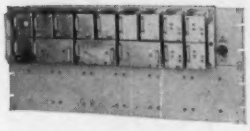
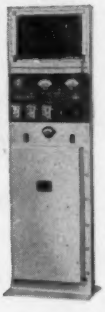


Static Interrupter

Bat Tap d-c Voltage Reducer

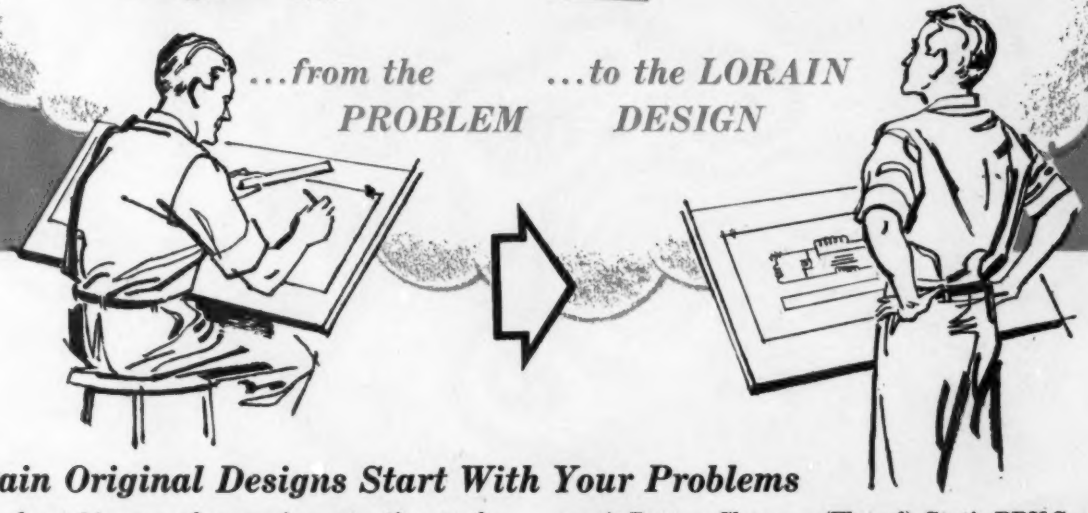
PBX Power Supply



Power Panel

Transistorized
Multi-Frequency Converter

Howler



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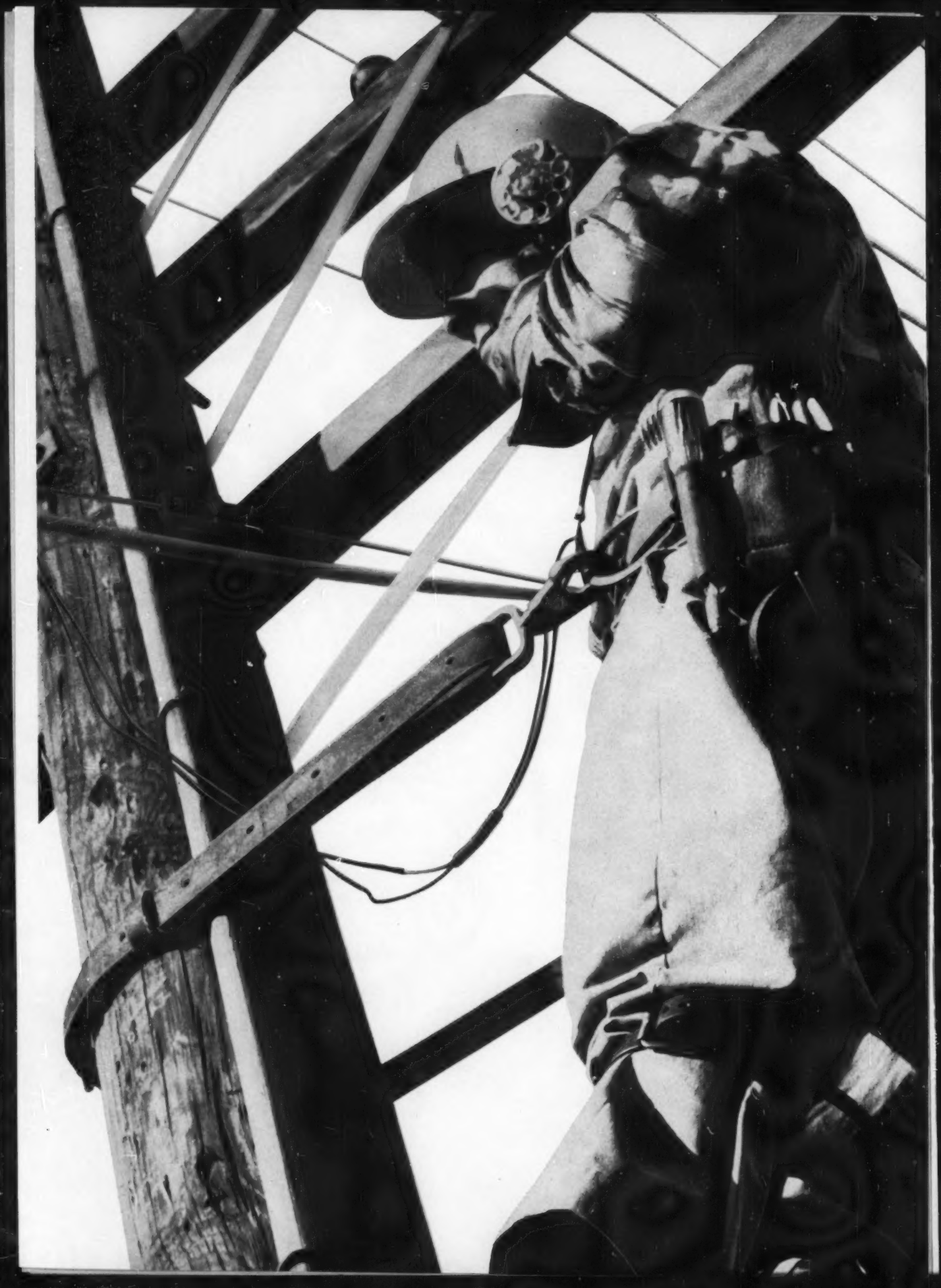

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USITA

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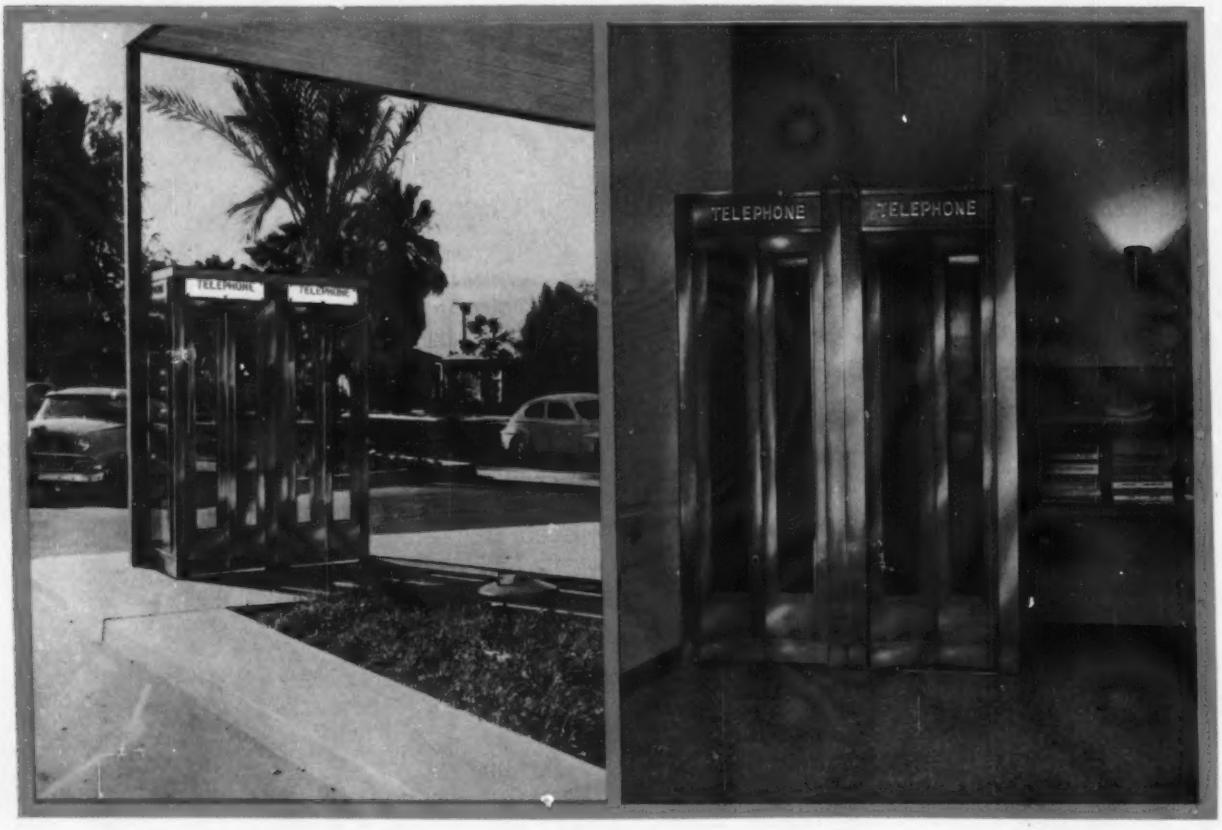
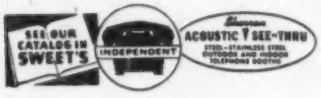


The Coachella Valley Telephone Company is one of many Independents upholding the tenets and aims of the USITA. Last year, this progressive company opened a new headquarters building in Indio, date and citrus center in southern California. Headed by J. C. Newman, president, this Independent is continually demonstrating its determination to provide better telephone service to more people. As witness the phone booths pictured here. These are Sherron stainless steel booths... which, to quote Mr. E. T. Burgess, commercial and traffic manager, "help to accentuate the beauty of our new office."

as demonstrated by enterprising COACHELLA VALLEY TELEPHONE COMPANY



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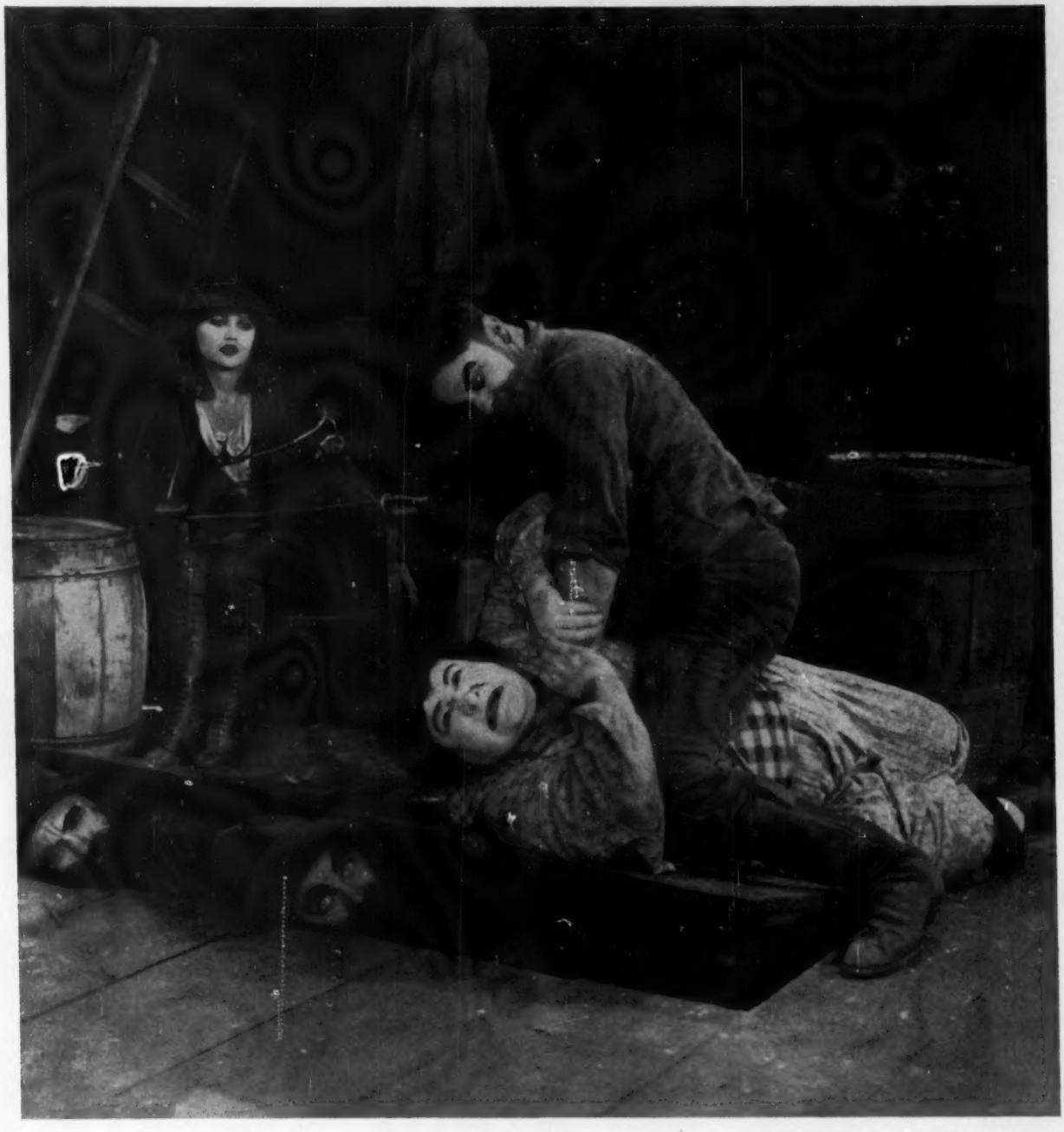

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Take beautiful music, add the artistry of beautiful women, and you have the Bell Telephone Hour for Friday, January 20.

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The result will be family entertainment at its best.

The program's commercial messages will feature public phones, Long Distance and extension phones.

Make it a date to see "Music Hath Charms" on the Bell Telephone Hour, Friday, January 20. Please consult your local TV listing for time and channel.

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But back to the pack. It combines a battery charger/eliminator with a ringing generator and a dial/busy tone generator in a complete, integrated power supply. And it will save you money. Here's why:

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WARREN IS A LONG, LONG STEP AHEAD IN TRANSISTORIZED COMMUNICATIONS EQUIPMENT FOR THE TELEPHONE INDUSTRY.

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR
AND EDITOR, PUBLIC UTILITIES FORTNIGHTLY

Eisenhower asks NASA to assist private industry in setting up satellite systems for world-wide telephone and TV service. Independent industry petitions FCC to suspend WATS proposal pending investigation. Sees indications of possible interstate toll rate reduction. Comments on effects of likely increase in minimum wage.

ONE OF THE MOST forward-looking things which President Eisenhower did during the last days of his administration was to give the nation's future communications policy a strong push into the area of free private enterprise and away from the shoals and entanglements of government ownership.

Whether the new Kennedy administration will follow through in this direction remains to be seen. But if it does not, it will at least be in the somewhat embarrassing position of stopping the momentum of this policy and reversing or altering its direction. In either event, Kennedy will then have to assume the burden of explaining why the Eisenhower decision was not a good one, or the right one.

Doubtless that is exactly what Ike had in mind when he, somewhat unexpectedly on Dec. 30, 1960, called upon the National Aeronautics & Space Administration (NASA) to give all possible assistance and encouragement to private industry in setting up satellite systems looking towards world-wide commercial telephone and television service.

This policy statement was unexpected, not because it represented anything new in the thinking of the Eisenhower administration (it did not), but because there was nothing immediately before the White House for action. The NASA had already expressed itself along the same lines. So, the fact that Ike took the initiative on this indicates that he wanted to leave no doubt about the position of his administration. There is nothing to suggest the Kennedy administration will actually have any other, or different, ideas about this. But Ike wanted to be sure that his regime was on the record, unmistakably, in favor of private enterprise. If the Kennedy regime should want to back off, it would be all the more obvious and very much subject to explanation.

American Telephone & Telegraph Co. and Hughes Aircraft have announced their intention to enter the satellite communications field. Several other companies have indicated that they will do so later. There are huge expenditures at stake—so much depends on whether the new Kennedy administration and the Congress will endorse the policy of the retiring President.

The White House policy statement instructed the National Aeronautics & Space Administration to:

(1) Push research and development projects to demonstrate the feasibility of radio and TV relay stations in space.
(2) Encourage private industry to put its own resources into development of satellite communications systems.
(3) Provide at cost the rockets and facilities to launch such privately-owned satellites into orbit.

It appeared possible, however, that the President, on the eve of his departure from office, may have sowed the seeds for a struggle comparable to those of the past on the issue of private versus public power. In his statement, Eisenhower said "the government should aggressively encourage private enterprise in the establishment and operation of satellite relays for revenue-producing purposes." Asked if the policy had been discussed with Kennedy, White House news secretary James C. Hagerty said, "Not that I know of." He agreed the discussion might spark controversy.

The President said this country traditionally has conducted international communications services "through private enterprise subject to governmental licensing and regulation." To achieve early establishment of a commercial satellite system, he added, will require "the concerted capabilities of funds of both government and private enterprise and the cooperative participation of

Kennedy Names Minow Chairman of FCC

President-Elect Kennedy on Jan. 9 announced selection of Newton N. Minow, a law partner of Adlai E. Stevenson, as chairman of the Federal Communications Commission.

Mr. Minow, age 34, a Chicago attorney, was named to replace Frederick W. Ford, a Republican, who is expected to remain on the commission, but not as chairman.

Before joining Stevenson's law firm, Mr. Minow served as an administrative assistant to Stevenson when the latter was governor of Illinois.

communications organizations in foreign countries."

Dr. T. Keith Glennan, retiring director of NASA, said in a speech on Oct. 12 that the government would provide launching facilities at cost for privately developed communication satellites. Hagerty said this was provided for "in principle" in Eisenhower's policy statement. Dr. Hugh L. Dryden, deputy director of NASA, told reporters at the White House that companies needing launching rockets would have to get their request in 18 to 24 months in advance. He said neither AT&T nor the Hughes Aircraft Co. has yet put in a bid for one. Dryden said NASA is studying two different communication systems, although the agency does not plan to operate either one. The military is working on a third and will operate it. The three systems are as follows:

Passive reflector: This is the Echo type, a giant metal-coated sphere which merely reflects radio signals beamed at it. Dryden said a system using 60 to 100 140-foot, 600-pound passive satellites in orbits 1,500 to 2,000 miles high 'could be realized very quickly.'"

Low-orbit active satellites: Such satellites receive and transmit. Unlike the Echo type, which is useful mainly for voice and telegraph, active satellites could relay television programs. Dryden envisaged a system of 20 to 40 100-pound active satellites in orbits 3,000 to 6,000 miles high.

High-orbit active satellites: This is the Defense Department's Advent project to put three satellites in so-called stationary orbits at 22,300 miles. At such an altitude the satellites would move at just the right speed to keep them permanently above a fixed point on earth. The military will use this system for its own purposes, but the technology developed would, as in the other cases, become available to private companies.

Asked when a commercial satellite system could be brought into existence, Dryden cited various estimates ranging from nine months to 10 or 15 years. "Our view," he said, "is somewhere in between."

Delay Sought for WATS

The Independent telephone industry (or at least a reported 75 per cent of it, according to stations and revenues) has asked the FCC to go slow on the recently proposed Wide Area Telephone Service (WATS). Specifically, the USITA on Jan. 5, on behalf of its 3,200 non-Bell member companies, petitioned the FCC to suspend the WATS proposal of the Bell system pending investigation (see also, in this issue: "General, USITA Ask FCC to Set Division of Revenues for WATS").

Re-inforcing the position of the USITA, the largest Independent system —General Telephone — had previously (Jan. 3) filed a similar petition with the FCC. The relative positions of USITA and the General Telephone System are approximately the same on this. They are not opposed at all to extending the new service, but they are worried about whether the Independent company "connecting carriers" are going to come out financially, on the revenue split.

The proposed new long distance, WATS, would provide unlimited or limited calling within specified areas for a flat monthly rate. Details were outlined in a tariff schedule filed by AT&T with the FCC on Dec. 16, 1960, to become effective Jan. 15, 1961.

One of the differences of opinion here is whether the Bell System can screen WATS calls for Independent territory. Another question arises as to whether straight toll call traffic will not be reduced or superseded by calls channeled through WATS customers. Thus instead of a straight toll call to a WATS customer from a non-WATS customer, an arrangement based on the old theatrical casting bureau advice ("don't call us; we'll call you") could result in the loss of straight toll calls, shifted in reverse through calls by WATS customers. Well, there are certainly things to be worked out.

The USITA petition said that the Independent segment of the telephone industry desires to participate fully in bringing this new long distance service to the public on a truly national basis but stated that because the Bell System has not made provision for proper compensation to Independent companies for use of their facilities, which would be involved in the handling of WATS messages, "the USITA believes it would be in the public interest to hold a hearing on these matters and, pending a determination thereon, to suspend the effective date of the new tariff."

The document cited that USITA's Settlements Committee has conducted negotiations with Bell System representatives for mutually satisfactory settlement arrangements for WATS messages interchanged by Bell and Independent telephone companies but that such negotiations thus far have been unsuccessful. Clifford C. Pearce of Riceville, Iowa, president of the USITA, emphasized that the Independents share the belief that the new long distance service will serve the best interests of

(Continued on page 58)

Convention Calendar 1961

Association	*Date*	*City*	*Hotel*
Louisiana	Feb. 15, 16, and 17	Shreveport	Captain Shreve
Minnesota	Feb. 19, 20, 21 and 22	Minneapolis	Radisson
Kentucky	Mar. 7	Lexington	Phoenix
Texas	Mar. 12, 13 and 14	Houston	Rice
Iowa	Mar. 23 and 24	Des Moines	Savery
Nebraska	Apr. 5 and 6	Lincoln	Cornhusker
Mississippi	Apr. 17	Unannounced	Unannounced
Ohio	Apr. 18 and 19	Columbus	Deshler Hilton
Indiana	May 9, 10 and 11	Indianapolis	Claypool
Illinois	May 17, 18 and 19	Peoria	Pere Marquette
Kansas-Missouri*	May 22 and 23	Kansas City, Mo.	Continental
Pennsylvania	June 5, 6 and 7	Pocono Manor	Pocono Manor Inn
Washington-Oregon*	June 15 and 16	Victoria, B. C.	Empress
New York	June 19, 20 and 21	Schroon Lake	Scaroon Manor
California	June 26, 27, 28, 29 and 30	Honolulu, Hawaii	Hawaiian Village
Alaska	Aug. 21, 22 and 23	Palmer	Unannounced
Arkansas	Sept. 11 and 12	Hot Springs	Arlington
Michigan	Sept. 19, 20 and 21	Grand Rapids	Pantlind
Nevada	Sept. 19, 20 and 21	Elko	Stockmen's
Rocky Mountain*	Sept. 20, 21 and 22	Boise, Ida.	Owyhee
USITA	Oct. 8, 9, 10 and 11	Chicago	Conrad Hilton
Virginia	Oct. 26 and 27	Roanoke	Roanoke
Oklahoma	Nov. 8 and 9	Skirvin	Oklahoma City
North Carolina	Dec. 4 and 5	Pinehurst	Carolina

*Joint meeting

Safety First is an attitude

By Alfred E. Campbell*

WHAT DOES THE average uninformed person think about the increase in the accident rate? Stop long enough to listen—observe what happens around you. You'll find people speaking of accidents as if they were a complete concrete thing tied up in an untidy package—like soiled linen—a thing that has to be—a necessary evil.

We treat accidents as though they were an indispensible element of everyday life. Sometimes it has to rain when we want sunshine or the wind blows too hard when we want to paint the house or take down the storm windows. We want rain for our parched lawns and we get the sun. We seek pleasure, fun and diversion, and instead we have accidents. And we say, "Yep, that's the way the old ball bounces!" Yes, sir—we've got the unmitigated gall to call them accidents.

Surely, now, you don't believe that the prevention of accidents is beyond our control. With the appalling number of automobile accidents, it certainly is apparent that something is wrong—dead wrong. Our performance is bad. The facts are inescapable. Not only are people becoming more careless on the job, but the same attitude of carelessness seems to be carried off the job.

Strong language? Maybe. For example, if you saw in cold, hard figures that your people had 440 accidents as opposed to 218 accidents for the same period the preceding year, wouldn't you be alarmed? Wouldn't you say to yourself, "Wow, we're slipping fast. Let's look into this thing. Something must be done."

This thing is a sickness that has crept in and we've got to throw it off before it overcomes us. Certainly we're not going to get well purely as a "gift from the gods." We've got to put up our "dukes" and fight. We've got to educate, and we've got to use all the tactical talents at our command.

Do you remember the article—"And Sudden Death" which appeared in a national magazine? It recommends some pretty strong medicine for all drivers—a vivid and sustained realization that every time you step on the throttle, death gets in beside you, hopefully waiting for his chance.

A view of a mangled body on a cold marble slab, waxily portraying the consequences of bad motoring judgment, still wouldn't be strong enough medicine. The picture would have to be viewed with sound effects and the pitiful flopping, the pointless efforts of the injured to stand up, the queer grunting noises, and the steady panting, groaning, snorting of a human being, as pain, excruciating pain, creeps upon him as the shock wears off; or the picture could shift to a child's crumpled body with its little bones crushed inward, and the life blood oozing out on the dirty pavement, as though it sadly ambled away from its shattered home.

But, enough for sudden death. There is nothing so completely and dramatically forlorn as the person maimed or crippled in an accident. Did you ever take a good look at their eyes? Like shattered windows in a house—where hope once lived, but now is dead. Despite all the pity and compassion you may feel for the victim, there is a shuddery, creepy feeling that you just can't seem to avoid having, and you shy away and constantly avoid these victims whenever you can, because they make you feel uncomfortable. God forgive us, I guess we're made that way.

So, it seems accidents create enmities, silences, coldness, and bitterness in a world that for about 1960 years has been struggling to lessen sickness and to heal the human hates and to bring warmth, kindness, and brotherly love into man's nature.

We perhaps should think of accidents as a builder of hate in our midst. Think of the motor accident you could have on your vacation. Children might lose a father. Think of the cruelty to innocent childhood—then think of the other children who will lose their fathers because of a so-called "accident." The effect upon society is ruinous. Hundreds of embittered mothers will condemn the accident maker and haunt him wherever he goes—there will be no escape.

So, if love is an essential attribute of heaven, then, certainly, hate must be an attribute of hell. I'm sure you'll never feel so close to the latter place as when the car you are driving kills or maims some child, or some mother, or some father.

The fact that you "had the right of way" or "I didn't see the little fellow. He darted out in front of me from between two parked cars" isn't going to salve your conscience one little bit. All the incessant and violent hate will be heaped upon you.

With all these things being common knowledge, why should safety education be such a slow, painful struggle? Lets tell ourselves that it doesn't have to be, for we are essentially decently controlled people; and we dare not pass over the accident list with superior scorn, for we are human.

In these days when accidents involving death and almost worse still, maiming, are so commonplace that the ambulance siren no longer causes us to turn our head, it behooves us to pull sharply up to attention and gird our-

(Continued on page 36)

*Mr. Campbell is Toll Wire Chief of Illinois Bell Telephone Co. at Rockford, Ill. He has been with the Bell System for 37 years.

ECHO

and

Civilian

Communication

By J. R. PIERCE*

"Sweet Echo, Sweetest nymph—
Sweet Queen of Parley, Daughter of the Sphere!
So may'st thou be translated to the skies
And give resounding grace to all Heaven's harmonies!"

—from "Comus" by JOHN MILTON.

THE TRANSLATION of Echo to the skies is the occasion, if not the theme, of what I have to say concerning the impact of space and satellites on communication. The translation itself was accomplished early on the morning of Aug. 12, 1960, and President Eisenhower's message was relayed from the West Coast to the East via the balloon communication satellite less than two hours later. Since then, Echo I has been used in two-way transcontinental telephony, in transmitting still pictures, and in signaling across the Atlantic.

The significance of the launching of this communication satellite is not to be arrived at without some thought. We might, for instance, regard it primarily from the viewpoint of our needs for electrical communication, an art which serves us well today and which will serve us better tomorrow.

Can Meet Telephone Needs

Today, there are over 70 million telephones in the United States and some 62 million in the rest of the world. In the 39 years from 1920 to 1959, the number of telephones outside of the United States grew by a factor of nearly eight, while the population increased only about 60 per cent. And, the number of overseas telephone messages is now growing at a rate of 15 per cent per year, corresponding to a factor of nearly 8 in about 15 years. With this in mind, we can think of satellites as a means for providing adequate and economical facilities to meet a real, present and pressing need for more telephonic communication.

Some, however, prefer to view anything which is concerned with space in a peculiarly romantic light, glorious as the infinity of the heavens, and about as remote from the real problems of the world. From this second point of view, I suppose one would be forced to regard Echo as an original, quick and decisive step in the wonderful realm of space, a realm in which nothing is impossible, a realm in which the most grandiose plans quickly become obsolete, not because they are tried and found wanting, but because someone comes forward with plans more grandiose still.

Alters Viewpoint Slowly

I think that we can dispense with this sort of nonsense in any serious discussion of space. There is, however, still another aspect of Echo, one which we must take into account if we are not to go astray in our thinking. Today we feel a need for communication of the sort that satellites can supply. Yet, at one time we would have felt no such need. A need for voice communication was by no means obvious to Alexander Graham Bell's contemporaries. The need itself, and the industry that fills it, both grew out of Professor Bell's invention and its successful development and exploitation. Many of the needs which seem most obvious today grew out of the very scientific and technological progress by means of which they are now satisfied.

From this third and entirely different point of view, the launching of Echo I has been a small part of a long, disorderly, hard-won but comprehensive increase in our understanding, control and use of natural processes.

Galileo, whom young Milton visited, laid the foundations of a new science of mechanics. Brought to maturity by Newton, this science has provided our basic understanding of the behavior of satellites in orbit, and of the rockets that are used to launch them.

In the intervening years other fields, including thermodynamics, electromagnetic phenomena, electronics, and the organization of complicated machines, which the uninitiated sometimes call cybernetics, have evolved.

This painstaking progress of understanding has been inextricably intertwined with, caused by and causing, a complicated world of technology, the world which supplies us with automobiles, airplanes, plastics, electric refrigerators, hydrogen bombs, satellites and, I should not omit, telephones. Without this stream of scientific and technological progress, we would not have all the things of which Echo is a tiny part, and if we did by some prescience feel a need for such things, it would be a vague and unreal need, indeed.

Awakening New Needs

The new needs engendered by scientific and technological progress, and the

*Mr. Pierce is Director of Research in Communications Principles of Bell Telephone Laboratories, Inc. He delivered this address to the Economic Club of Chicago on Dec. 8, 1960.

further progress necessary adequately to fill such needs, seem in retrospect to have come upon us quickly. We contemplate with amazement a remembered day when people crossed oceans on ships rather than in planes, or an even remoter day when the few bumped over rutted roads in automobiles while the many rode smoothly in streetcars and trains.

Yet, from the detailed viewpoint of a contemporary, the course of events was less breathtaking. Sixteen years elapsed between the first controlled powered flight and the first transatlantic flight, and over a quarter of a century more passed before transatlantic air travel became commonplace. In considering the technical aspects of satellite communication, we should neither expect progress to seem as rapid as it will one day appear to have been, nor should we confuse a landmark with a whole history.

Thus, scientific and technological progress is an historical process which, like the hands of a clock, seems slow to an observer, however quickly time may in fact pass. Such progress must have stages or elements, and perhaps we can use Echo as an example in illustrating these.

Satellite Communication Idea

Certainly, we cannot have progress without a good, detailed, feasible *idea* as a starting point. Ideas come from human minds. They are obtained by imaginative thinking, not through the expenditure of millions of dollars. Important as ideas are, however, a mathematician would call them a necessary, but not sufficient, condition for progress. We simply can't make progress without ideas, but some ideas are poor ideas, and cannot lead to progress. And even good ideas are only a part of what is needed.

The idea of satellites for communication has occurred and recurred in more concrete and precise forms over a period of years. It is old in science fiction. In 1945, Arthur C. Clarke published a technical paper describing a particular sort of satellite communication system. In 1955, I published a technical paper in which I computed the performance of several sorts of satellite communication systems, including the passive balloon satellite, of which Echo I is the first example. In the same article, I considered carefully what useful functions communication satellites might serve.

Impractical for TV

A quantitative examination of the possibilities and limitations of satellite communication in the light of the current and foreseeable state of the technical art makes several things clear. One

J. R. PIERCE

is that the power required to broadcast television programs directly from satellites to home television receivers will be impractical in any near future, especially when we take into account the relatively short life of high-power electronic equipment. Such a service is unattractive in any event, for it does not allow the local insertion of news, or advertising which is characteristic of and valuable to present TV. I think that we shall be spared the destruction envisaged by my friend, Arthur Clarke, in a recent issue of *Playboy*, in which he wrote of a Communist plot to blanket the country with pornography telecast from a satellite.

Conquer Ocean Barrier

Communication satellites do, however, offer the possibility of overcoming a very serious barrier to electrical communication—the barrier of the oceans. Over land, we can communicate readily by various forms of cables, which carry television as well as voice signals. We can also communicate by means of microwave radio signals, which travel in straight lines from one hilltop tower to the next, and are there amplified and beamed forth to another hilltop tower on another horizon.

In talking across an ocean, we have in the past used short-wave radio waves, which travel beyond the horizon, because they are somewhat erratically reflected by the ionosphere, those charged layers lying from 50 to some hundreds of miles above the ground. Short waves comprise a small range of radio frequencies, totally inadequate for television, and terribly crowded by a mere part of the transoceanic voice communication that we need.

Since 1956, submarine telephone cables have provided the first high quality voice, data, and radio program circuits across the Atlantic. Present transatlantic telephone cables have amplifiers every 40 miles, amplifiers designed to last for over 20 years under the tremendous pressure of the sea. These amplifiers are supplied with power through the cable itself. These transoceanic cables are among the great engineering achievements of all ages. However, the difficulties of the task limit the performance attained. The cost of a transoceanic cable capable of transmitting 48 voice channels is comparable with that of a transcontinental microwave system capable of transmitting thousands of voice signals and several television signals.

While spanning the oceans by plane is scarcely more difficult than spanning the continent, we see that the oceans offer a tremendous barrier to electrical communication. The telephone and television circuits across the country provide a band of frequencies 100 times as great as *all* of our transoceanic telephone circuits, radio and cable together. We have no facilities at all for transoceanic television. This is not because there is not need for more transoceanic communication; it is because transoceanic communication is difficult and expensive.

It is this communication barrier which I saw in 1955 to be the chief one that satellites could overcome. This was before the launching of the first Sputnik, late in 1957. Such a sober and candid examination was a desirable step, even before satellites existed. But, it was not until *after* the launching of satellites had become a repeatable, usable technique that satellite communication deserved the hard and extensive work which is necessary to render any new idea profitable.

Make Satellite Idea Work

For ideas do not do our work for us; rather, they cause us to expend our effort wisely and profitably in realizing the promise of the future, instead of unprofitably in retracing the ways of the past.

The National Aeronautics & Space Administration's (NASA) Project Echo is a first step between a general idea and ultimate practical application. It is a simple and limited satellite communication experiment. Its great virtue is that it has been carried out, it works, we have learned a great deal through it, and we are now ready to take another step forward.

When I talked to various military people in Washington in 1958 about satellite communication, most wanted to start out by planning a satellite communication system, or at least a prototype system, of very great complexity. Happily, some people who knew how hard it is to do even seem-

(Continued on page 24)

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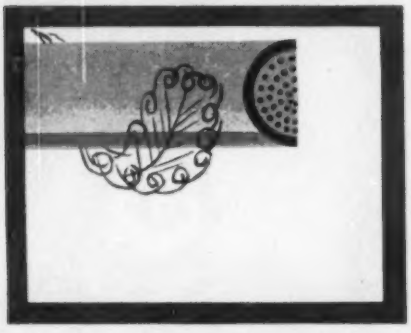

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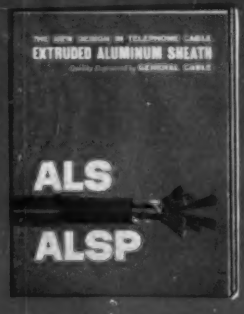

SHEATH

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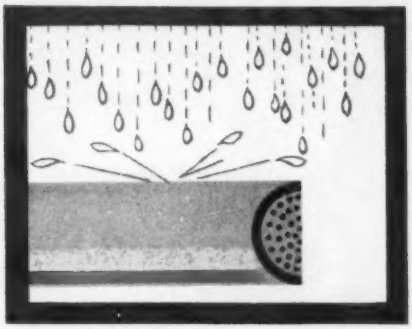

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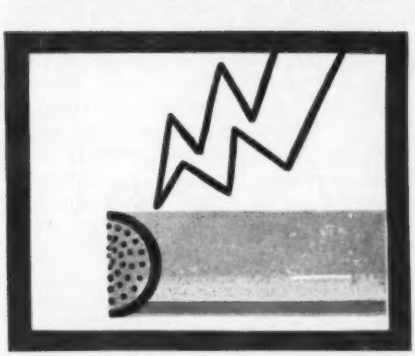

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ingly simple things for the first time were willing to settle for less. William J. O'Sullivan, of the National Aeronautics & Space Administration's (then the National Advisory Committee of Aeronautics) Langley Laboratory, had already constructed 100-foot metalized plastic balloons which he hoped to orbit in order to measure atmospheric drag. William H. Pickering, head of the Jet Propulsion Laboratory, later to be transferred from the Army to NASA, was favorably impressed by the idea of a satellite communication experiment using such a balloon.

By the beginning of 1959, T. Keith Glennan, the administrator of NASA, and Hugh Dryden, the deputy administrator, were convinced of the value of an experiment, and, under Leonard Jaffe, Project Echo had been launched. The Bell Laboratories provided funds for the construction of the communication equipment we would need for our part of this experiment.

Even with adequate money and good people, the job was certainly not easy.

On the satellite side, NASA had to solve the problem of folding and packing a ten-story balloon into a 26-inch spherical container and releasing and inflating it without tearing. This involved the release of such balloons a hundred miles above the earth's surface in five shot-put shots made with solid fuel rockets from Wallop's Island, Va.

A new Douglas vehicle configuration, the Thor Delta, was to be tried for the first time in launching the balloon.

The Bell Laboratories' Titan guidance system had to be adapted for the launching.

On the communication side, we were faced with the problem of putting a new sort of FM receiver and unprecedentedly broadband FM to use for the first time. We used for the first time in a communications receiver a maser amplifier, so sensitive that the microwaves due to the heat of the earth would form an overwhelming noisy input. We built a special "horn reflector" antenna to keep the microwave heat of the earth from reaching the receiver.

The Jet Propulsion Laboratory had to build a new transmitter and a new antenna. NASA, JPL, and the Bell Laboratories had to devise a scheme by means of which the transmitting and receiving antennas can be kept pointed at the Echo satellite by means of data computed in advance and transmitted by teletypewriter to the locations at which data is later used.

This tracking system had to be tested; the moon and the Tiros weather satellite were used for such tests. You can see that the bare idea of Echo led inevitably to many other ideas, each calling for its quota of inspired work. But, through overtime and devotion, everything was ready by May 13, when the first and unsuccessful attempt to launch an Echo balloon was made. The interval between May 13 and the successful launching of Aug. 12 provided a welcome opportunity to polish and recheck equipment.

Echo has indeed been translated to the skies, but it would take many words, and perhaps more than words, to give an adequate idea of the deep thought and long hours of work that hundreds of people have spent in accomplishing this.

What Follows Experiment?

And Echo is merely an experiment. It is a first step beyond the general idea of satellite communication to particular ideas, particular problems and their solutions. It is a concrete step toward a new way of spanning the seas electronically. But more work lies ahead of us than behind us. Only such work will disclose and bring into being in all its necessary detail a useful satellite communication system.

What are the further steps that lie between us and satellite communication systems which can carry a heavy telephone and television traffic between continents? Echo I is a *passive* satellite, which merely reflects to the receiver at the far side of the ocean about a billionth of a billionth of the microwave power beamed at it.

I believe that the next step will be the orbiting of an *active* communication satellite, equipped with a microwave receiver which will pick up a signal from one side of the ocean and a microwave transmitter which will send an amplified version of that signal on to the other side of the ocean. The Courier satellite is a forerunner of such satellites.

An experimental active satellite adapted to television transmission may be launched within the next two years. It is impossible to set precise space timetables in a world in which many launchings fail.

Transoceanic TV Experiment

Beyond such an experimental demonstration of the transoceanic transmission of television—but we hope not too far beyond it—lies the development and construction of an operating satellite system. A world-wide commercial system might make use of around 50 satellites at altitudes of from 2,000 to 5,000 miles, enough so that one satellite would rise to provide communication for a fraction of an hour as another set. Or, some sorts of communication might ultimately make use of a number of more complicated satellites 22,000 miles above the equator, each circling the earth in just the 24 hours it takes the earth to turn on its axis, and each, when viewed from the earth, hanging stationary in the sky. The choice of the particular system for a particular purpose at a particular time depends on knowledge and art which will be gained in further study and experiment.

Commercial System Problems

Thus, a commercial satellite communication system must wait upon the demonstrated solution of technical problems, especially problems of reliability and life, through the construction and use of further experimental communication satellites. It must wait on other things as well.

One of these is, of course, the allocation of frequencies for the operation of such systems. The frequencies needed are the sort of microwave frequencies which are used by the military for various radar, guidance and communication purposes. They are the sort of microwave frequencies which are used in sending thousands of telephone conversations and many television programs across the continent. They are the same sort of microwave frequencies which are used by public safety organizations to carry messages along turnpikes, and by oil companies and public utilities to carry messages along pipelines, power systems and railroads. They are the same sort of frequencies that have rightly or wrongly been proposed to many businessmen as a means for reducing their communication bills.

Microwave systems are proliferating like rabbits in Australia, and there aren't enough frequencies for all proposed uses. Efficient and economical world-wide satellite communication will require the allocation of thousands of megacycles of microwave frequencies on a *world-wide basis.* The use of these frequencies for other purposes seems to be impossible within a radius of some hundreds of miles from any satellite ground terminal.

Thus, effective transoceanic communication by means of satellites necessarily requires that the use of microwave frequencies for communication over land must be in some degree limited and controlled. This is a difficult problem which national and international organizations now face, and among them the International Telecommunication Union which is now a part of the United Nations.

Another and nontechnological problem which satellite communication faces is that of ownership and operation of the satellites (if one *can* own a satellite) and of the ground equipment used in satellite communication. Tradition-

(Continued on page 39)

How Subscribers Look at Trouble — Section 2

By L. N. MARTIN

IN OUR PRECEDING article (TELEPHONY, Nov. 19), we discussed exchange trouble as seen from the subscriber's viewpoint. Every businessman must consider the viewpoint of his customers and this is especially true in the telephone business, in which public relations can make or break a company.

The telephone man may rightly believe that his knowledge of what constitutes good telephone service is superior to that of the subscriber. Nevertheless, he must give full consideration to the opinions and complaints of his subscribers and, at the same time, he should so win their confidence that, when necessary, he can explain to them the reasons why some of their wishes are impracticable.

We closed the last article by stating that *Clearing time* is a vital factor in shaping the subscriber's opinion of the company's trouble performance. The subscriber will tolerate much more trouble if each case is cleared promptly.

Company Controls Clearing

Much trouble is beyond the control of the company, but clearing time is almost entirely within its control. However, it must be balanced by a practical consideration of the costs. The company might go on a case of trouble with the same speed that the city fire department answers a fire alarm, but this would involve a garage with idle trucks warmed up ready to go and a force of repairmen spending most of their day playing checkers. The increased cost would of course be ultimately paid by the subscribers who would not want such a trouble service under that condition. We believe, however, that the clearing time can be greatly improved by close attention to this subject and that the increase in costs will be very moderate.

On first thought, "clearing time" would mean the time in hours and minutes between the report by the subscriber and the clearing of the case by the company. However, this is not the way it is usually counted by companies that make a study of this item. A common practice is to count only "trouble clearing hours," i.e., the hours during which the repair force is on duty. The trouble clearing hours are usually 8 a.m. to 5 p.m., six days a week. If the lunch period is staggered, this makes a nine-hour trouble clearing day. This may be increased to 11 hours by scheduling part of the force 7 to 4 and another part 9 to 6.

PART 77. The preceding article in this series appeared in the Nov. 19, 1960 issue.

Light on Weekends

Except for storm trouble, the trouble load on Saturday will be light as most factories, wholesale houses, and business offices are closed, and hence are not reporting trouble. Saturday is usually covered by a much reduced force. Sunday is usually observed as a day of rest and only emergency trouble is cleared.

When the "trouble clearing hours only" rule is in use, a case reported at 4 p.m. and cleared at 9 a.m. the next day has a two-hour clearing time, and a case reported at 4 p.m. Saturday and cleared at 9 a.m. Monday also is charged with only two hours clearing time. This method is fair to the repair forces. If they are to be held accountable for the clearing time they should not be charged with the time that they are off duty and cannot clear trouble. But what does the subscriber think about this? Is it fair to him?

Of course any subscriber would be happy to have his trouble cleared within a few minutes after he reports it —day, night, or Sunday. (He would be even happier if he never had a case of trouble.) The question is: "Does he expect such service? Will he blame the company if he does not receive it?"

He does not expect to have his car repaired at night or on Sunday or even on Saturday. There are some exceptions. Minor repairs may be obtained at a filling station and if the car fails on the road a 24-hour towing service to a garage is usually available. However, repair work will not start until the next business day. The telephone company will also care for real emergency trouble at any time.

We believe any reasonable subscriber knows that 24-hour trouble service, seven days a week, is impracticable and he does not expect it. On the other hand, to be without telephone service over night may be a serious matter for a residence subscriber. Protection at night may be a major reason for having a telephone. In fact, the company may have stressed this point when they sold him the service. To be out of service overnight may also be serious for some business subscribers.

Carried-Over Trouble

This brings up another important factor — Carried-Over Trouble — in the company's effort to please the subscriber.

Carried-over trouble means a case that is not cleared on the same day that it is reported, even though the clearing time, computed, as explained in the foregoing, is satisfactory. Many companies close the day's trouble log at 5 p.m. (or when the repair force leaves for the day). Trouble reported after 5 p.m. goes on the next day's log and is not classed as carried-over trouble. This rule reflects the efficiency of the repair force, as it should not be charged with carrying over trouble which is reported after it has left for the day. What does the subscriber think about this? We believe that most subscribers who report trouble, at say 7 p.m., understand that the repairmen have left for the day and unless some real emergency exists they can expect their telephones to be out over night. The best the company can do is to clear all cases that are reported *before* quitting time. In another article, we will discuss methods of doing this.

Now, let us return to "clearing

time." Records of clearing time must be kept. Otherwise the company will not know its present clearing time and whether it is increasing or decreasing. To compute the *average* clearing time in any period, such as a month, quarter, or year, would be a costly clerical job and the result would be of little value. The subscriber is not interested in the company's averages, but he is much concerned about any case of excessive clearing time on his own telephone. The company's records should show how often this occurs.

Setting up Objectives

One method is to set up clearing-time objectives. Then when a case of trouble is cleared the question is asked: "Was this case cleared within the objective or was it not cleared within the objective?" The answer is indicated by a single check mark on the log or trouble ticket. These check marks are totaled at the end of the day and summarized by months, quarters, or the year. This is a very simple and inexpensive clerical job.

When setting up clearing-time objectives, it will soon become apparent that continuous telephone service is much more important to some subscribers than to others. Even companies who make no study of clearing time recognize this fact. They clear business telephones first and residence stations second. Their reasoning probably is: The business subscriber pays a much higher rate and is a better toll customer than the residence subscriber. He is also more subject to a money loss when his telephone service fails than is the residence subscriber.

All companies know that certain subscribers, such as the police and fire departments, doctors and hospitals must be restored ahead of all other telephones. Also (we are sorry to say) many companies place the rural telephone at the bottom of their trouble clearing program.

Rural Service Vital Today

In the horse and buggy days there may have been good reasons for leaving rural trouble to the last. A long drive over muddy roads might take a repairman away from the city for many hours. During this time he could have cleared many cases in town. At the present time, a large majority of the rural lines are on all-weather roads. In fact a truck may be driven five miles in the country in less time than it could work its way through a mile of city traffic. Continuous service is more vital to the farm home than to the city home, and we believe that the farmer should at least rank equally with the city dweller in trouble-clearing preference.

The subscribers might be divided into quite a number of classes each with its own clearing-time objective, but this would complicate the plan and increase its cost. We believe that three classes are enough and that there should be some flexibility within and between the classes.

First of all, come the community emergency services that we have mentioned. The distinguishing feature of this class is that a failure of these telephones endangers the welfare, property, and even the lives of everyone in the community. Nobody should be included in this class just because his service is very important to *himself*. The list will vary with the type and size of the community and it will include some residence telephones, such as the residence of a doctor. In a small community, it might include the homes of all the volunteer firemen. However, not every case of trouble reported by this group constitutes an emergency.

Determined Locally

Suppose a large hospital, or a combined police and fire dispatching office, has a PBX and 10 trunks. One trunk out of service is not an emergency and this case should take its turn with other trouble. What if nine trunks are out? A PBX that requires 10 trunks for normal traffic cannot give even emergency service on one trunk. The trunk would be continuously busy and an emergency call would have little chance of getting through. Somewhere between one trunk out and nine trunks out is the dividing line between an emergency and a non-emergency case. This can be determined locally.

Trouble on this class of telephones should be cleared as soon as possible, day, night, or Sunday. If an objective is set up, we would suggest one-half hour.

The second class would include all business telephones not in the first class. Telephone service is more valuable to the larger concerns, but these customers will have multiple lines or trunks and complete failures should be rare. Also if continuous service is very important to a large concern that has a PBX and 10 or more trunks, the telephone company may wish to route half of the trunks through another cable. This can often be done by placing a few blocks of small cable.

Some smaller businesses are so dependent on the telephone that they would rather lock their doors than be without service. Should not such a business have more than one line? By explaining to them that some trouble is inevitable and that it cannot always be cleared within a few minutes after it is reported, the company should be able to sell them additional service.

Third Class

The third class would include all residence telephones, both urban and rural.

Dividing the subscribers into three classes does not prevent the company from giving preference to a particular case when the circumstances justify such action. Thus some emergency in a home may justify clearing that case ahead of any business telephone. The plan should always be flexible.

There are two kinds of trouble reports: (1) "Subscriber Reports," which are the reports received from subscribers, and (2) "Company Reports," which cover troubles that are discovered by telephone employes, or which are called to their attention by permanents, flashing line signals, or alarms. In a dial office, practically all company reports are the result of the many alarm circuits found in these offices. A clear understanding of these two kinds of reports is necessary when making studies of subscriber reaction, such as clearing time and carried-over trouble studies.

Avoid Duplicate Reports

A company report is usually received before the subscriber has discovered that his telephone is out of order, therefore, (so far) there is no subscriber reaction. The trouble may be cleared by the company, or come clear (many permanents come clear) before the subscriber knows that his telephone has been out of order. In that case, from the subscriber's viewpoint, there has been no trouble.

On the other hand, the subscriber may discover and report the trouble before it has been cleared or has come clear. Many companies handle this by excluding (or cancelling) the company report and entering a subscriber report. This avoids duplicate reports on the same case of trouble. Clearing time starts with the time that the subscriber report is received.

There are, therefore, two trouble summaries: (1) The summary of subscriber reports from which all studies and analyses are made, and (2) the summary of company reports which may contain some valuable information but which has no bearing on subscriber reaction.

Reducing clearing time and reducing carried-over trouble are really one project. Both affect the time that the subscriber is out of service due to a case of trouble. In our next article we will suggest practical methods of effectively carrying out this project at a moderate cost.

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

THE WORLD'S FIRST factory designed to mass-produce quartz crystals for communications purposes went into operation on Dec. 1, 1960, at the Merrimack Valley Works, of the Western Electric Co.

This action marked the successful climax of over 50 years of scientific experimentation and research. It also releases the United States from dependence upon a foreign supply of quartz crystals. A strategic material, crystals were in critically short supply during World War II.

Quartz crystals are used in radio and television transmitters, telephone communications, radar and sonar. Previously, their only source has been the interior of Brazil. Here, the mining of the fist-sized crystals required for communications is performed by individuals on a free-lance basis, resulting in unstable supplies and high prices.

This new factory grows quartz crystals of superior size and quality in a sort of scientific rock garden, under tremendous pressure and heat. In the growing area, 20 cylindrical vessels, each about 10 feet long and a foot in diameter, are sunk below the surface of the floor. A long wire basket is lowered into each vessel. "Seed" crystals of natural or artificial quartz are suspended in tiers at the top of the basket. The lower half of the basket is filled with small, inexpensive pieces of natural quartz. Quartz in this form is readily available from many sources, but it is unsuitable for communication purposes.

Before being sealed, the vessel is filled with a weak alkali solution to start the growth cycle. A heavy steel shield is lowered over the top by a crane to provide additional protection. The contents of the vessel are heated to a temperature of 700 degrees, and the interior pressure reaches about 25,000 pounds per square inch.

About three weeks of continuous growth is required to produce a harvest of crystals. Due to the heat and pressure, the small pieces of quartz at the bottom of the basket dissolve into the alkali solution. Crystals of quartz are re-deposited from solution and slowly build up on the "seed" plates at the top of the basket, where the temperature is slightly lower.

Not only does the Bell System's process for growing artificial crystals cost just a fraction of the price of natural crystals, but the artificial variety contains less imperfections. Dimensions can be controlled and much more of each crystal is usable.

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We recently enjoyed a visit with Harold L. Boerlin in his all-electric home a few miles south of Fredericksburg, Va. This is truly an all-electric home, in lighting, cooking, water heating, and heating. Baseboard heaters are installed in all rooms, and each room is controlled by an individual thermostat. The temperature can be adjusted to suit the occupant of each room or turned off entirely when not in use.

This type of heating has numerous possibilities in many communities. With the average central heating system, about 15 per cent of the heat is lost in transmission from the furnace to each room. In addition, too, the installation of electric heat costs much less than the conventional type central heating system.

To balance the air-conditioning summer load, many power companies are establishing a most attractive rate for winter heating. In this case, Mr. Boerlin pays only 1½ cents per kw.

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An electric light switch plate now on the market provides a guide light in a darkened room. It is claimed that this light will operate for more than five years at a cost of only five cents a year.

This switch plate can be used on any "single-toggle" switch. When a switch is turned off, the Panelescent light is activated. When the switch is turned on, the lamp is extinguished. It replaces any conventional "single" switch plate. A screwdriver is all that is required for installation.

This Panelescent lamp in the switch plate produces light over the entire surface of a metal panel by the principle of electroluminescence—the creation of light through the excitation of certain phosphors in an electrical field. Only .025 inch thick, the lamp produces a uniform light without the use of bulbs, tubes, filaments, or cathodes. Its construction consists of a porcelain steel sheet with a ceramic-phosphor coating.

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A new sign is now available for installation along highways, 2 miles, 1 mile, or ½-mile ahead of your pay-stations. This gives motorists ample time to slow down and stop safely.

White letters on a field of telephone blue are used on panels of heavy gauge steel. The entire unit is 33 inches high when installed and easy to read so that all drivers will see it. The distance indication can be furnished, as required.

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In a recent letter, Bill Dillon, of the W. C. Dillon & Co., Inc., Van Nuys, Cal., made the following comments with reference to an item which was published on this page recently describing the hard knocks absorbed by the old-time lineman of yesterday.

"It took me back to when I started climbing poles at Girard, Kan., in 1895. From that time until about '99, we used Western-type climbers. It was common practice to come down poles in long jumps. The snub-nose gaffs would often peel out, but we would

catch again before hitting bottom when we were lucky.

"Using this type climber on 60 and 70-foot poles, commonly used at that time, was quite a trick. Hanging at the top of one of these poles with one leg hooked around it and pulling up a ten-pin crossarm on a handline, and driving two lag screws, required both intestinal fortitude and physical stamina.

"Safety belts were unknown in those days. We just depended on the old leg and the small gaff of the Western climbers to hold us up there.

"I remember also working in Birmingham and Memphis from 1900 to 1904, when none of our high poles had pole steps and all were loaded with 10 ten-pin crossarms. The life of the old-time lineman, from 1895 to about 1920, was especially rugged."

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Although we have had the dial telephone since 1893, no country, as yet, has a 100 per cent dial system. Switzerland is nearest that goal with a government-owned national telephone network that is 99.9 per cent dial. The Netherlands is second with 98.3 per cent. West Germany, Italy, East Germany and Austria follow in that order.

The United States with a dial development of 91.9 per cent, has less than 5 million manual telephones.

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For many years, we talked about telephone subscribers. Then, we changed to telephone customers. Now, we are informed that the term "telephone user" is preferred. Perhaps, this makes sense, as often a telephone user may be neither a subscriber nor a customer. A person making or receiving a collect call would be a telephone user, but need not be either a telephone subscriber or a customer.

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We are indebted to D. S. Guild, vice president-operations, of the Hawaiian Telephone Co., for a copy of the magazine, *Paradise of the Pacific*, 1961 holiday annual. This is a most attractive publication and does a marvelous job of describing the beauties of our 50th state.

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Crosstalk: It is well said that there's nothing wrong with the younger generation that becoming taxpayers won't cure.

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It is reported that the average American now pays more in taxes than he does for food.

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Much of the trouble in the world today is blamed on the fact that we're educating too many children and not enough parents.

Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

Q. Will it be practicable to bury all types of plastic-jacketed cable without mechanical protection?

A. Direct burial telephone cable is recommended for this purpose. This type of cable features double jacket and a metallic-tape shield. The inner jacket provides mechanical protection, plus additional dielectric strength between the core and ground. The high-molecular weight polyethylene sheath is highly resistant to abrasion, weathering, moisture, corrosion and environmental cracking.

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Q. Is it possible to obtain a high gain headset for use by hard-of-hearing operator?

A. A transistorized headset is now available for this purpose. A small amplifier unit is housed with the plug in a metal case, 2½ inch by 1⅜ inch by 3 inches at the end of the headset cord. The volume control knob is on the front of the case. This design avoids the need of adding weight to the headset.

With the use of this device, it is not necessary to make any alterations in the headset or switchboard circuits. The single transistor obtains its operating voltage from the operator's circuit. The amplifier unit becomes operational when plugged into the position jack.

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Q. What is the meaning of the term "even-count" cable in an exchange distribution system?

A. This means that the pair grouping is based on an even number of 100. Subgroups are used that may be evenly combined into 100.

In the early days of the cable industry, a certain number of pairs failed during manufacturing and installation. It was found to be much cheaper to add extra pairs in a cable, rather than to repair defective pairs. From the beginning, it was the intent of manufacturers to provide good pairs in multiples of 100. In order to insure this, an extra pair for each 100 was added to provide the necessary safety factor.

When manufacturing methods improved, more of these spare pairs become usable. Then, operating companies started to use all good pairs, and this developed into an uneven or "odd-count" numbering system for both cables and main frames. Groups were numbered 1- to 101, 102 to 202, etc.

When pairs were not color-coded, this was a workable system, albeit always confusing. When polyethylene-insulated conductors and color-coded pairs came into the picture, and manufacturers guaranteed all pairs, the extra pair and the "odd-count" were no longer necessary. The even count in cable terminals simplifies records and reduces the difficulty of pair identification.

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Q. Can you furnish us any information on the repair of transistorized radio receivers?

A. The repair of transistorized radio sets requires a special technique. Although similar to their vacuum predecessors in basic design, they require new thinking in circuit theory, design, operation, and service. New methods and procedures must be utilized to properly diagnose troubles and successfully repair these sets.

It is suggested that you obtain a copy of a soft cover book of 168 pages titled: "Repairing Transistor Radios," authored by S. Libes. This book can be obtained from TELEPHONY for $3.50. It is written for the electronic technician. The beginner will also find it a practical and easy-to-follow guide.

Basic transistor theory is presented simply and systematically. Current transistorized circuitry designs are covered with regard to operation and repair. These discussions are complemented with an explanation of superheterodyne radio receiver principles as they are currently applied to transistor radios. Also included is an evaluation, from the electronic technician's point of view, of current practices in design of transistor portable AM, multiband, imported, all-transistor, auto-hybrid, and FM receivers. The repair sections are elaborate and detailed.

Courts and Commissions

OK Purchases, Loan, Area Extension, Rates in Neb.

The Boyd County Telephone Corp., Lynch, on Dec. 21 was given permission by the Nebraska Railway Commission to:

Purchase the property of the Springview Exchange Telephone Co., furnishing magneto service to 147 company-owned stations and 90 switching stations.

Purchase the property of the Johnstown Telephone Co., furnishing magneto service to 81 company-owned stations and eight switching stations.

Serve the area of the Mills Telephone Association, all but one subscriber having signed an abandon agreement.

Serve five switching lines at Springview as company-owned facilities.

The commission also issued a certificate of convenience and necessity authorizing the Boyd company to serve the areas of the other parties to the agreement. A loan of $490,000 through the REA was also approved for the purpose of rehabilitating the properties and installing dial service.

The following rates were approved, effective Jan. 1, for areas now receiving dial service and for other areas effective on conversion:

One-party business	$9.75
Two-party business	8.75
Rural business	8.00
One-party residence	6.50
Two-party residence	6.00
Four-party residence	5.50
Rural residence	6.00

The Boyd company furnishes dial service for 459 company-owned stations at Lynch, Naper and Verdell and the adjacent rural areas.

The net book rate is computed at $363,348. The new rates are expected to produce annual operating revenue of $45,105; annual operating income, before interest, of $13,960 and a rate of return of 3.84 per cent.

MST&T's Service Area Request Rouses Wyo. Protest

The Range Telephone Co., Forsyth, Mont., it was reported on Dec. 20, has protested to the Wyoming Public Service Commission the application by Mountain States Telephone & Telegraph Co. to serve eight additional townships in the Beulah-Aladdin area of Wyoming. At the same time, the Range company filed an application to serve the area, and in addition, the area of Hulett on the Wyoming-Montana border, where Mountain States likewise seeks to serve.

Wyoming Commission Secretary Dwight Dahlman, in an action which was pending before the commission on July 12, said that Mountain States had acquired some of its properties prior to the effective date of the state's public utilities act, which permitted companies then in operation to extend plant facilities into areas contiguous to their lines, and where no other like service was offered (TELEPHONY, July 2, 1960).

Mr. Dahlman said that under that statute, MS&T had filed exchange area maps with the commission to validate its service claims.

In another service area dispute, Mr. Dahlman said that Mountain States contends it holds a monopoly on service in the areas in question by virtue of its service maps.

In the latest petition, filed on Dec. 20, Mountain States proposed that the Beulah-Aladdin area be served from the Belle Fourche and Spearfish, S. D., exchanges of the Northwestern Bell Telephone Co.

Hearings on EAS and Rate Requests in Wisconsin

The Wisconsin Public Service Commission on Jan. 9 was to have heard the application of the Grant County Telephone Co., Livingston, for authority to cut its exchange over to dial and to discontinue extended area service between Livingston and the Linden exchange of the Linden Telephone Co.

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On Jan. 10, the commission had also scheduled a hearing on the application of the Belmont Telephone Co. for authority to establish EAS between Belmont and the Platteville exchange of the Platteville Telephone Co., and to increase its rates in connection with this EAS.

OK GT&E Plan for Control Of N. Y. Company's Stock

The New York Public Service Commission on Dec. 29 approved a modified joint proposal of Orange County Telephone Co., Middletown, and General Telephone & Electronics Corp., New York City, under which General will acquire ownership, through voting control, of Orange County (TELEPHONY, Oct. 8, 1960).

The proposal approved on Dec. 29 differs from one rejected by the commission in September in that it does not involve consideration of the plan of reorganization under which ownership of the physical plant of Orange County Telephone might, at some future date, be transferred to General Telephone Co. of Upstate New York, a subsidiary of General Telephone & Electronics.

With this most recent commission action, Orange County telephone may now reclassify its outstanding 50,000 shares of common stock as "class A" stock with each share having one vote, and issue and sell to General Telephone & Electronics 30,000 shares of a new "class B" common stock, each of which will have 1.7 votes. Acquisition of that stock, to be sold at not less than $38.31 per share, will give General a 51 per cent controlling interest in the Orange County company.

The $1,149,300 to be derived by Orange from the sale of the new stock is to be used to retire outstanding short-term notes aggregating slightly more than $500,000 and to redeem 3,750 outstanding shares of preferred stock at a cost of about $391,000, with the balance to be used to finance plant additions and improvements.

Orange County telephone serves about 17,500 subscribers in a 250-square-mile area.

The original plan, which the commission rejected in September as not being in the public interest because it benefitted the present owners of Orange rather than its subscribers, sought commission approval of a plan of reorganization which could not be consummated until termination of a trust established

under the will of the late Edwin Fancher, former president of Orange, which must continue while either Charles C. Chappell or Frank D. Fancher, the trustees, are alive.

In refusing to approve that plan, the commission adopted a report by Examiner William T. Wilkinson in which he noted that the reason for the proposed deferral of the transfer of Orange to Upstate was to enable the Fancher estate trustees to avoid payment of taxes for which they might otherwise become liable.

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Also on Dec. 29, the commission authorized Highland Telephone Co., Monroe, to issue not more than 3,250 additional shares of 5 per cent $100-par preferred stock. The company proposes to issue the new stock in exchange for short-term notes issued this year to finance plant improvement programs.

The company serves more than 12,000 stations.

Ohio Company Is Seeking General Rate Increases

The Commonwealth Telephone Co., Athens, a subsidiary of General Telephone & Electronics Corp., filed formal application with the Ohio Public Utilities Commission on Dec. 23 for rate adjustments affecting all exchanges.

The company's proposed business rates were not included in the news item to which TELEPHONY had access, but it is understood that Commonwealth advertised them.

The Commonwealth rate proposal covers four classifications of areas, or bands, based on the size of exchanges stationwise.

Rate increases negotiated five years ago enabled a return of 5.84 per cent, according to the company. The current increased rates, if granted, would increase gross revenues by some $37,000 monthly, giving a return of approximately 5.58 per cent.

Compile Neb. Commission Rules Under One Cover

Rules of practice and procedure of the Nebraska Railway Commission have been codified into one loose-leaf book.

Approved by the attorney general's office, the project took almost two years to complete and was done largely by staff members, department heads and technical assistants, including a professor in the college of law at the University of Nebraska.

Commission Chairman Joseph Brown said the codification was aimed at making it easier for anyone to ascertain what rules govern commission decisions and its general operations.

Witnessing recent ground-breaking ceremony for construction of a new dial building at Malcom, Ia., were (from left): K. J. Griffin, General Telephone Co. of Iowa division manager; W. T. Autry, operating vice president; Joseph L. Van Horn, president of General of Iowa; Ray Dayton, mayor of Malcom; and E. M. Fouts, manager for General at Grinnell. The event marked the end of an era for General of Iowa. When Malcom is changed to dial, all exchanges operated by the company will be dial. Five years ago, the company was only 20.2 per cent dial. Since that time, 26 exchanges have been converted to dial operation.

Additions and amendments will be made annually by loose-leaf additions or replacements.

Grant Permanent Injunction In General of SW Tex. Case

Judge W. R. Blalock of the 93rd Texas District Court on Dec. 22 granted the General Telephone Co. of the Southwest, San Angelo, a permanent injunction against the city of Weslaco in the company's two-year-old rate case (TELEPHONY, Oct. 15 and Nov. 12, 1960).

In granting the permanent injunction, Judge Blalock, who had refused a temporary injunction, said points brought out in the earlier hearing "have been so strengthened and clarified by uncontroverted evidence in the hearing on the merits" that he felt the company was "entitled to the injunctive relief sought."

In the history of the case, Weslaco city commissioners on June 16, 1960, passed an ordinance denying the rate increase sought by General of the Southwest, and lowering the rates for intrastate calls originating in Weslaco.

On Sept. 2, General petitioned for an injunction prohibiting the city from carrying out the ordinance.

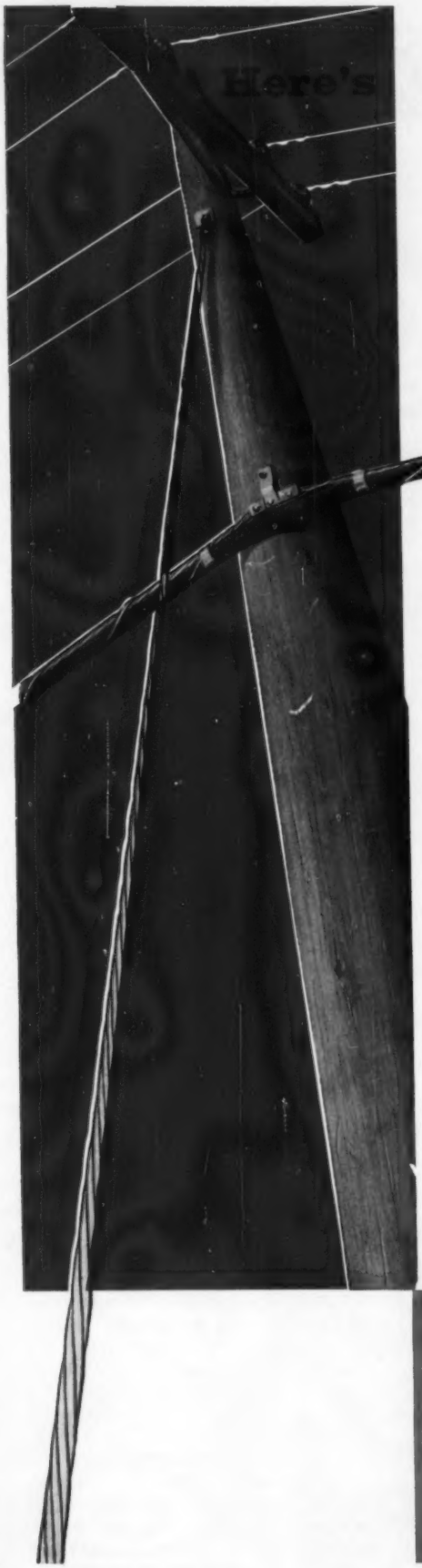
Then, on Sept. 19, Judge Blalock granted the temporary injunction. Both the company and the city of Weslaco served notice of appeal. However, the court reporter's record of testimony in the injunction hearing was reportedly stolen, and since neither of the parties could agree on stipulating testimony for the missing record, both asked for a permanent ruling.

It had been expected that Judge Blalock would make an early decision in the case, since his term of office was to expire on Jan. 1. The city had a 10-day period to serve notice of an appeal following the decision, and spokesmen for the commissioners indicated that an appeal action would be taken, although no formal announcement was made on the day of the ruling.

ACLU Asks FCC to Study Monitoring Overseas Calls

The Federal Communications Commission has been requested by the American Civil Liberties Union (ACLU) to investigate the monitoring by telephone company technicians of overseas telephone calls carried over radio-telephone. The FCC was asked to determine whether there is any violation of the Federal Communications Act involved, if the monitoring practice is substantiated.

Lawrence Speiser, Washington direc-



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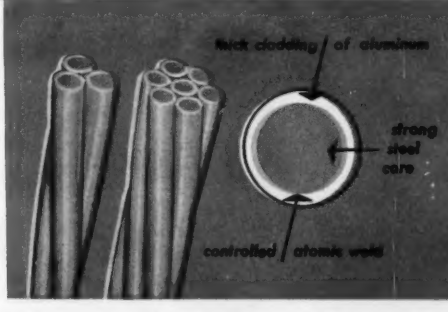


Alumoweld's thick aluminum covering—25% by area—is applied by an entirely new cladding process—the controlled atomic weld. For complete information on Alumoweld Strand, write for Engineering Bulletin E.D. 3000.

tor of ACLU, suggested that the commission consider the possibility of companies using some electronic device to check on the distinctness and clarity of the overseas conversations.

If it is established that only technicians can perform this service, the commission is asked to look into the desirability of having some notification given to the conversing parties that their call is being monitored.

General, USITA Ask FCC to Set Division of Revenues for WATS

TELEPHONE operating companies of General Telephone & Electronics Corp. on Jan. 3 petitioned the Federal Communications Commission to establish a division of the revenues which would be derived from the jointly rendered portion of a new long-distance telephone service proposed by American Telephone & Telegraph Co.

As an alternative, the GT&E companies asked the FCC to establish the "proper principles and procedures" for the division of revenues. The petition also requested the commission to suspend the tariff for the new service, called "Wide Area Telephone Service" (WATS), until either of the two alternatives is established. The tariff, filed with the FCC by AT&T on Dec. 16, would become effective Jan. 15, 1961, unless suspended by the commission.

Commenting in New York on the filing of the petition, Donald C. Power, chairman and chief executive officer of GT&E, stressed that the General System is in accord with the objectives of the proposed new service but pointed out that "before our operating companies will be able to offer or participate in the new service, they and the Bell companies must reach an agreement which will provide our operating companies with a fair share of the revenues derived from the jointly rendered portion of the new service."

"The 24 petitioning companies, together with Alaska Telephone Corp. which also is a GT&E subsidiary, comprise the nation's largest Independent telephone system, serving more than 4 million telephones in 31 states. Because the facilities of all Independent companies are directly or indirectly connected physically to those of AT&T or the associated Bell System companies, WATS would involve not only the participation of the General System companies but also more than 3,500 other non-Bell companies throughout the country. The Independent companies, including the General System, serve a total of some 11.5 million telephones out of the nation's total of more than 74 million telephones," GT&E stated.

WATS is designed to provide broader and more flexible service by permitting unlimited or limited calling within a certain specified area for a flat rate. The subscriber would be furnished a special access line over which he would originate interstate station-to-station calls to a choice of six zones. He would not be able to receive calls or to make person-to-person, collect, credit card, or intrastate calls over the special line.

The tariff filed by AT&T would permit WATS calls to any physically inter-connected telephone located within the defined service areas, regardless of the ownership of the facilities used in completing the call. Pointing out that "there is no effective method by which these non-Bell companies can refuse to complete incoming calls originating in Bell System territory," the General System companies asked that the tariff be suspended until an agreement is reached.

"Although intending to use the petitioners' facilities for WATS, the Bell System has not made satisfactory provision for compensating petitioners for the use of their facilities," the companies said.

The provision of WATS by the telephone industry is in the public interest, the General System companies said in the petition. However, they stated that "WATS can only be economically offered if the entire telephone industry in the Continental United States participates . . . the petitioners cannot reasonably be expected to offer or participate in the provision of that service until arrangements have been made to compensate (them) for the use of their facilities."

"If the Bell System institutes WATS without adequate compensation to petitioners for the use of their facilities, the economic health of petitioners and of the Independent telephone industry will be threatened, and the public will be injured in that the financial ability of the petitioners to provide adequate telephone service to its subscribers will be impaired," the petition stated.

* * *

Following is an announcement made by USITA in connection with its petition to the FCC asking that that commission establish a division of revenues between Bell companies and Independent companies applicable to service rendered under the WATS program:

The United States Independent Telephone Association, representing the interests of some 3,200 Independent telephone companies, on Jan. 5 petitioned the Federal Communications Commission to suspend the new Wide Area Telephone Service proposed by the American Telephone & Telegraph Co. pending investigation and hearing to "establish just and reasonable divisions of the charges applicable to service jointly furnished by Bell System companies and Independent telephone companies."

The proposed new long distance service (WATS) would provide unlimited or limited calling within specified areas for a flat monthly rate. Details were outlined in a tariff schedule filed by AT&T with the FCC on Dec. 16, 1960, to become effective Jan. 15, 1961.

The association's petition said that the Independent segment of the telephone industry desires to participate fully in bringing this new long distance service to the public on a truly national basis but stated that because the Bell System has not made provision for proper compensation to Independent companies for use of their facilities, which would be involved in the handling of WATS messages, "the USITA believes it would be in the public interest to hold a hearing on these matters and, pending a determination thereon, to suspend the effective date of the new tariff."

The petition further declared that the tariff does not provide for compensation to participating Independent companies for the use of their facilities "whether voluntary or involuntary."

The document cited that USITA's Settlements Committee has conducted negotiations with Bell System representatives for mutually satisfactory settlement arrangements for WATS messages interchanged by Bell and Independent telephone companies but that such negotiations thus far have been unsuccessful.

Clifford C. Pearce of Riceville, Ia., president of the USITA, emphasized the Independents share the belief that the new long distance service will serve the best interests of the public, but said "we cannot conscientiously in good faith and in fairness to our customers agree to participate until provision for adequate compensation for use of property involved has been made."

"We sincerely regret," he added, "that we have been unable to negotiate satisfactory settlement arrangements with the Bell System on an industry-

It was "back to school" for 87 Minnesota telephone people during a special two-day accounting seminar sponsored by Minnesota Telephone Association, Inc., at Hotel Radisson, Minneapolis, in December. Keith W. Vogt, Minnesota secretary, said 48 telephone companies were represented at the two-day event, which reviewed latest accounting procedures prescribed by the Minnesota Railroad & Warehouse Commission. Commercial accounting, plant accounting and REA plant accounting were the titles of three separate sessions. Instructors were R. A. Jungman of Minneapolis, REA field auditor; and Harvey W. Knutson and Reynolds Thielen of the St. Paul accounting firm, Macoubrey, Knutson, Olsen & Thielen.

wide basis. We waited until the 11th hour before intervening with the commission as our court of last resort in the hope that some satisfactory proposal to us would be forthcoming from the AT&T representatives."

REA Summarizes 1960 and To-Date Telephone Loans

The Rural Electrification Administration on Jan. 4 reported that in its telephone loan program, the number of subscribers who have benefited passed the one-million mark during 1960. The number of commercial companies and cooperatives to obtain telephone loans increased to 727 borrowers in 45 states during the year. Practically all the service provided through REA loans is dial.

In 1960, telephone loans approved amounted to 106.9 million dollars and funds advanced to telephone borrowers by REA totaled 105 million dollars. There were 48 new borrowers in 1960. Total loans to date to all borrowers came to 737 million dollars.

Of these REA telephone borrowers, 515 are commercial companies and 212 are cooperatives.

Loans approved in 1960 will aid in providing new or improved service for 190,000 subscribers, bringing to 1,470,000 the number of subscribers who will benefit.

During the year, telephone borrowers paid 16.2 million dollars in principal and interest, including an increase of more than 1.5 million dollars in the amount paid ahead of schedule. Since 1949, when Congress authorized the telephone program, borrowers have repaid approximately 25.3 million dollars of principal including a balance of 4 million dollars in the amount paid in advance of due dates. They have also paid 19.6 million dollars in interest. Only 11 telephone borrowers were delinquent in payments amounting to $311,570.

Obituary

R. J. FAULHABER, 67, who for many years was associated with Independent manufacturing companies, died on Dec. 18 in Glendale, Cal.

R. J. FAULHABER

Mr. Faulhaber began his telephone career with the old Dean Electric Co. of Elyria, O. and later became sales manager for the former Monarch Telephone Mfg. Co. of Fort Dodge, Ia., and when that company was purchased by American Electric Co. of Chicago, he became sales manager of the latter firm.

When American Electric became a part of Automatic Electric Co., Mr. Faulhaber held various sales executive positions. He resigned from Automatic Electric in June 1937, to become vice president and sales manager of Leich Sales Corp., which was founded by Mr. Faulhaber and R. W. Siemund. He remained in this position until his retirement in September 1949. Since his retirement, Mr. Faulhaber had made his home in Glendale.

He is survived by his widow, Nell.

Edison Medal to Dr. Osborne

Dr. Harold S. Osborne of Upper Montclair, N. J., retired chief engineer of the American Telephone & Telegraph Co., has won the Edison Medal of the American Institute of Electrical Engineers, it was announced on Jan. 3. The award will be presented at the institute's winter general meeting in New York, Jan. 29-Feb. 3, at the Hotel Statler.

New British Cable Ship

The British-government owned Cable & Wireless Ltd. on Dec. 20 launched a new 4,000-ton cable ship, the Retriever. Until 1962, when an 8,000-ton vessel is to be commissioned, the Retriever will be the largest of the Cable & Wireless fleet of seven.

Seeks Name Change in Wash.

The Connell (Wash.) Telephone Co., Inc., has requested authority to amend its charter of incorporation to change its name to Columbia Basin Telephone Company.

AE offers a complete package for your dial

Changes, changes, changes! That's what happens when you convert to dial. Your central office equipment must be changed. New phones must be installed. Your outside plant may require replacement. But, the results are worth it...

If your changes are made properly, you provide better service and boost your revenue. Dealing with AE is mighty good assurance of getting things done the right way from start to finish. That's because we offer *a complete package* designed to meet *all* your conversion needs.

Are you planning a dial conversion? Then get in touch with us. We've helped hundreds of telephone companies to solve their dial conversion problems. We'd like to do the same for you. Just write Automatic Electric Sales Corporation, Northlake, Illinois. In Canada, Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto 16.

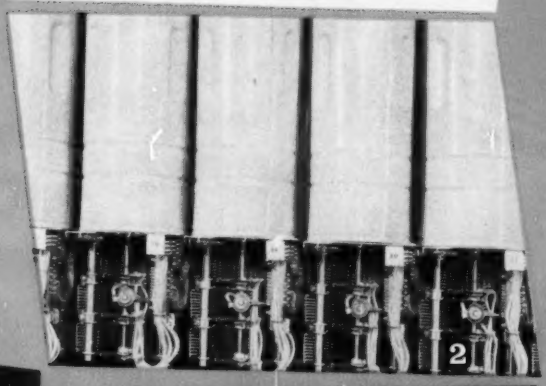
AUTOMATIC ELECTRIC GENERAL SYSTEM

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

conversion

1



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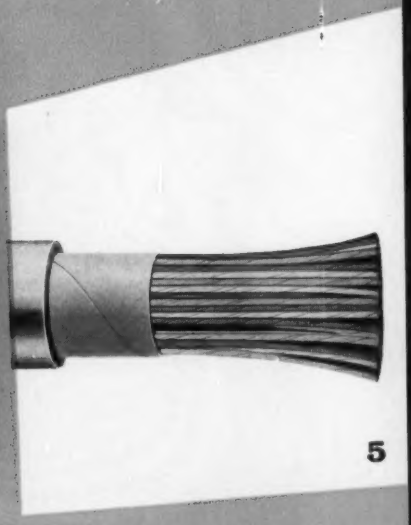

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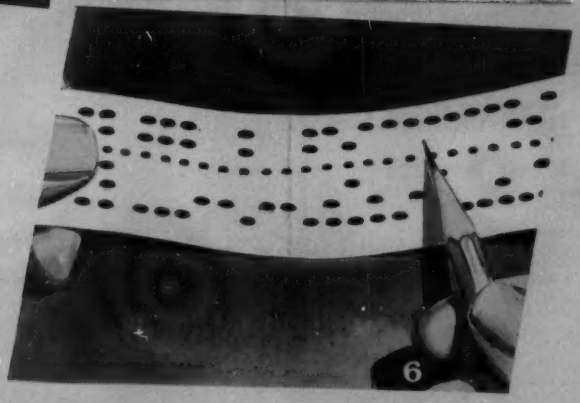


6

1 Modern dial phones. AE has a complete line of instruments to meet the needs of any residential or business subscriber in your area.

2 Strowger Automatic dial switching equipment. The simple design of this famous equipment insures minimum maintenance. Provision is made for many modern features which you may want to offer in the future. And, Strowger is easy to expand for later growth.

3 Dial paystations in a choice of 10 colors. The color attracts attention. And, with dial service, it's easier to make paystation calls. Result: You increase revenue from people on the move.

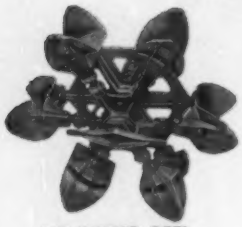
4 P-A-B-X systems. When you convert an exchange, your PBX subscribers will want to change to dial. AE offers you stock delivery on six P-A-B-X models. And, there's a choice of 16 auxiliary services to meet special needs of your customers.

5 Transmission facilities. AE offers facilities and equipment for all transmission needs—open wire, cable, microwave and carrier.

6 Automatic Toll Ticketing. The simple circuits and unitized construction of Strowger equipment permit it to be adapted quickly and economically to provide automatic toll ticketing. And, Strowger equipment works directly into accounting machines, without converters.

GENERAL MACHINE PRODUCTS COMPANY, INC.

Old Lincoln Highway at Pa. Turnpike, Trevose, Pa.



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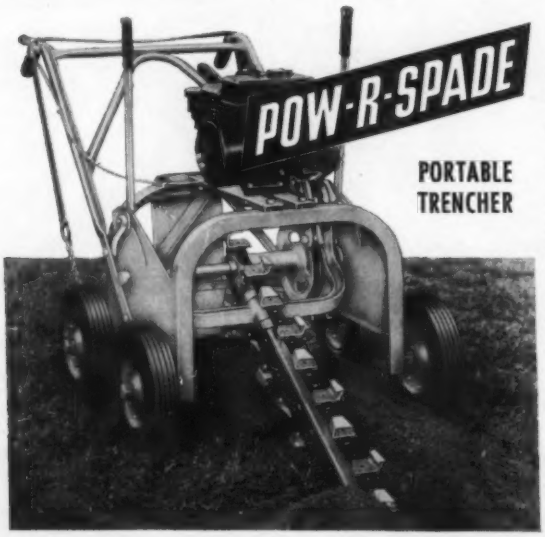
Over 600 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate shipment



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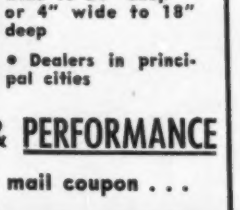


Rock Island 8-9527

SAFETY FIRST ATTITUDE

Concluded from page 19

selves for a stronger position on the question of safety — both on and off the job.

Safety, humanly speaking, is a job and also a duty. There never was a job, whether it be large or small, that could be made a complete success without learning and practicing safety methods. No *safe* job, however large, ever ended in the bitterness of failure.

Just to quote a few statistics: For Americans under 35 years old, accidents are the leading cause of death today—think of that—and we're supposed to be a civilized people. In 1959, over 96,000 men, women, and children in this country were killed by accidents, and,—get this—*more than 9 million* (one out of every 19 Americans) were hurt badly enough to cause disability in some degree! Every three seconds someone is disabled, and every six minutes someone is killed. The bill for medical treatment and lost earnings alone is over 10 billion dollars a year!

"Act of God, did you say?" "No sirree," as grandpa used to say. It's "Act of Man." Think of this—at least nine out of 10 accidents are caused by human error and could be prevented by a minimum of thought and care. Some people have more than their share—in fact some people are so prone to accidents that it's more economical to get them off the payroll regardless of their skill. So be alert — look alive — stay alive — and help to keep your fellow man alive.

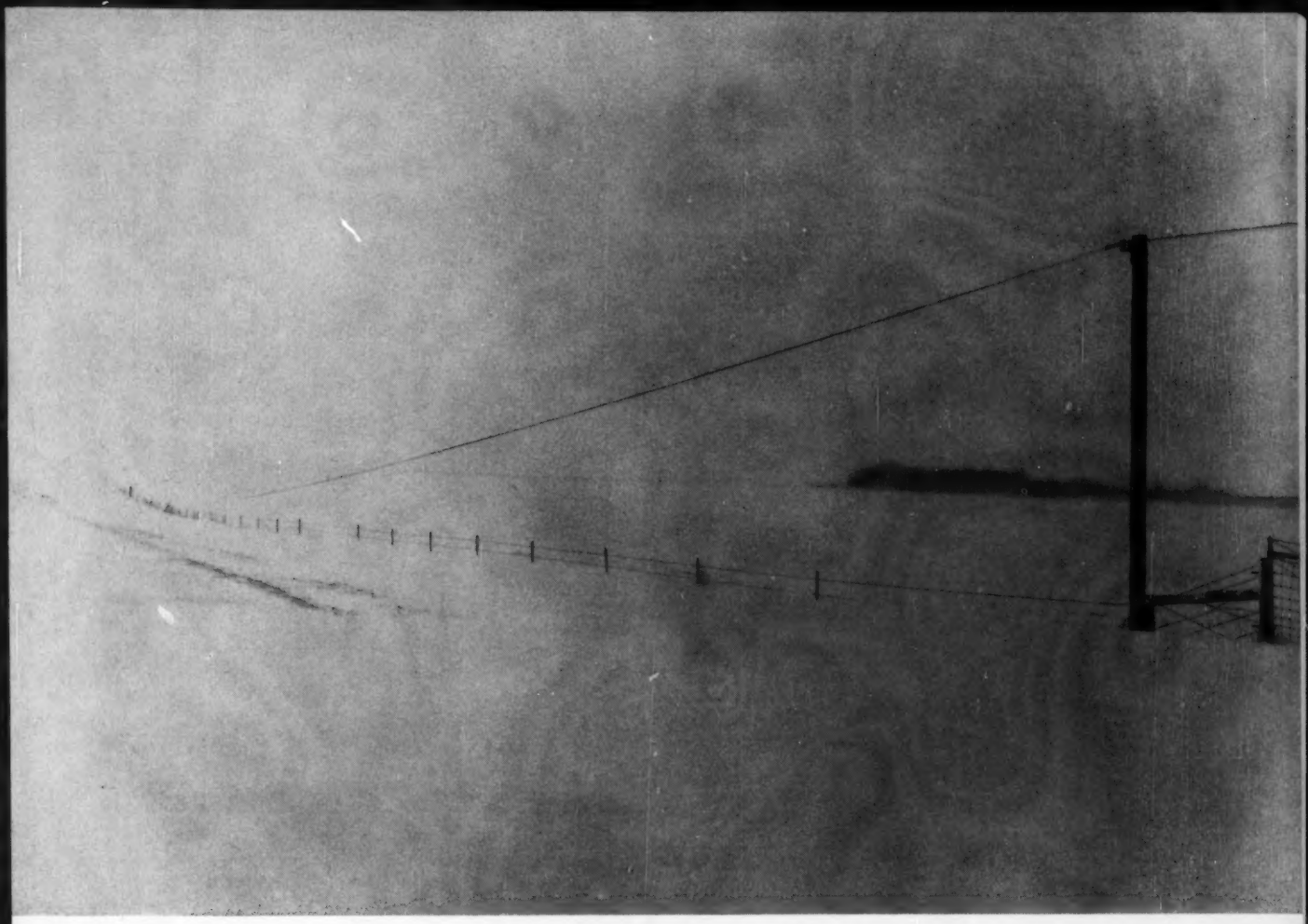
The materials for changing the accident picture are right in our hands, and we can do our part. Safe working, defensive driving, common courtesy on the road, consideration for the rights of others—these are the essential ingredients for building a safer and happier world which will help to tear down the factories of hate our needless and thoughtless accidents have been building.

Link London, CENTO Cities

A high frequency radio telecommunication link between London and other capitals of Central Treaty Organization (CENTO) nations is expected to be completed by April, 1962. Cities involved are Ankara and Istanbul, Turkey, Teheran, Iran, and Karachi and Dacca, Pakistan.

Fear of Unpredictable

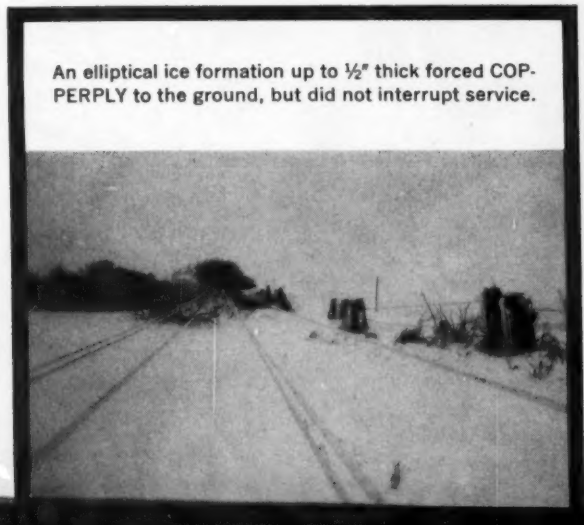
"It is not the crook in modern business that we fear, but the honest man who does not know what he is doing." —OWEN D. YOUNG.



"The lines are down... but I hear you perfectly"

These words came from a Tyler, Minnesota farm wife during a severe ice storm last winter. She could see that the lines were down. But there was no interruption in service.

Throughout the entire countryside around Tyler, the Tyler Telephone Company had installed .080-25 COPPERPLY conductor wire in new long-span lengths (up to 1900 feet between poles) to test a completely new concept in aerial insulated wire plant. By stringing insulated COPPERPLY over such long spans, it is possible for the wire to rest on the ground, when loaded with ice, before it reaches 55% of ultimate strength. When the ice load melts, COPPERPLY returns to the normal unloaded height above the ground.



An elliptical ice formation up to ½" thick forced COPPERPLY to the ground, but did not interrupt service.

At Tyler, National-Standard COPPERPLY remained under three feet of snow in some places for as long as three months, with no interruption in line service. In addition, long-span systems cut installation costs, eliminated the problem of mid-span hits, reduced tree trimming and maintenance costs. For information on the complete line of COPPERPLY conductors, write National-Standard Company, Niles, Michigan. C-61-2

NATIONAL-STANDARD COMPANY
Niles, Michigan

IMPORTANT
Effective
January, 1961
CABLED LOOP DESIGN
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on ALL POPULAR SIZES of
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TRADEMARK
GUY-GRIP dead-ends
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Designed to meet your specific design requirements, Cabled Loop GUY-GRIP dead-ends give you the most dependable guy . . . at the top . . . at the breaker . . . at the anchor.
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For complete information on how to apply Preformed GUY-GRIP dead-ends, send for the 32-page Application Procedure book "The Good Guy" and the 24-page, pocket-size companion booklet.
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ECHO AND COMMUNICATION

Continued from page 24

ally, transoceanic communications have been carried out cooperatively on a nonpolitical basis by the various organizations which provide telephone and telegraph service. In most countries these are departments of the government, usually the post office, as in Great Britain, France and Germany. In some countries, as in Canada, the organization is a government-owned corporation. In our own country, regulated private corporations provide telephone and telegraph service.

Transoceanic Radio

In the case of transoceanic radio, in each country the organization which provides telephone or telegraph service owns and operates the short-wave transmitters and receivers in its territory, whether this be the U.S.S.R., Great Britain or the United States.

In the case of telephone cables, the cable is paid for and owned jointly by the telephone organizations of the countries which it links.

This seemingly complicated ownership of international communication facilities has a long tradition of successful operation among countries of the most widely varying and antagonistic politics. In some countries, it is a matter of law as well as of tradition. It has been little affected even by the cold war.

There is no financial or technological obstacle to following the same pattern in satellite communication. The initial cost of a satellite communication system will be comparable to that of a large cable system. Technologically, satellites are merely a new and powerful way of providing more and better international electrical communication.

There are, however, many people who regard the science and technology of space, not as one aspect of the world's long course of scientific and technological progress, but primarily as a unique battleground of the cold war, in which national prestige is to be lost or won. Such people are apt to ask, can't we use satellite communication against the Russians, or at least to stay ahead of them in some sense? Can't our government give satellite communication to other countries as a very special gift, and thus curry favor with them?

Such an attitude is dangerous. In divorcing space science and technology from the centuries of science and technology of which it is a part, we not only misinterpret its nature; we also abandon successful ways of dealing with real national and international problems and raise a host of new prob-

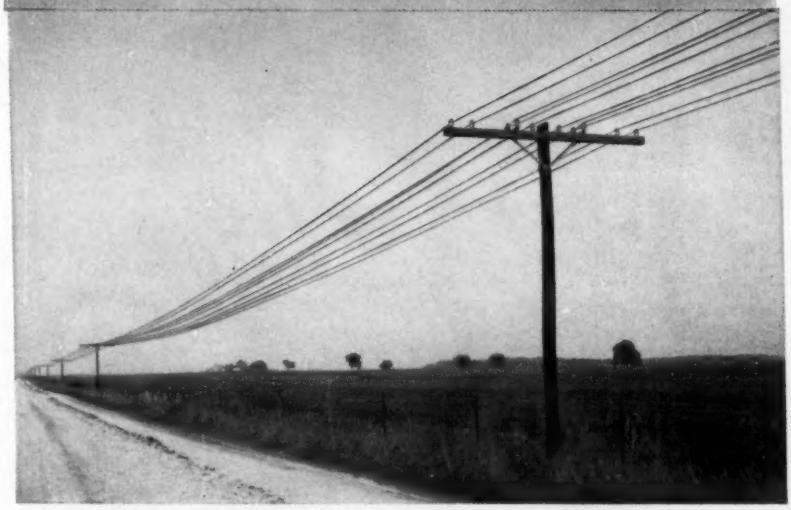
Crapo HTL-135

High Tensile Line Wire

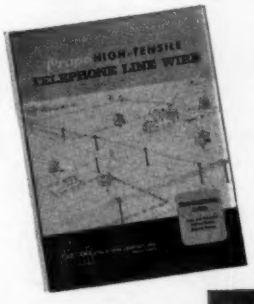
MADE TO WITHSTAND HEAVY STORM LOADS

Time and time again, *Crapo* HTL-135 has demonstrated its ability to stand up under heavy ice and wind loads when other conductors failed. This can be attributed to the fact that *Crapo* HTL-135 combines high strength with high fatigue endurance plus superior elastic qualities which enable it to spring back into place when loads are removed. The result: service interruptions are minimized, re-sagging is seldom necessary, where this rugged telephone wire is used.

The excellent telephonic transmission characteristics of *Crapo* HTL-135 make practical subscriber loops of 14 to 15 miles with normal voltages and equipment. Longer loops are possible where higher voltages and more sensitive telephone sets are employed. For dependable, long-span, low cost rural lines, specify *Crapo* HTL-135.



HERE'S PROOF OF DEPENDABILITY



The **Crapo** HTL-135 in this typical rural line of 300-foot spans was subjected to two heavy ice storms within 14 months. This photo shows the line, without resagging, three months after the second storm.

Write for Manual TM-59 containing complete engineering data!

Crapo HTL-135

INDIANA STEEL & WIRE CO., INC.
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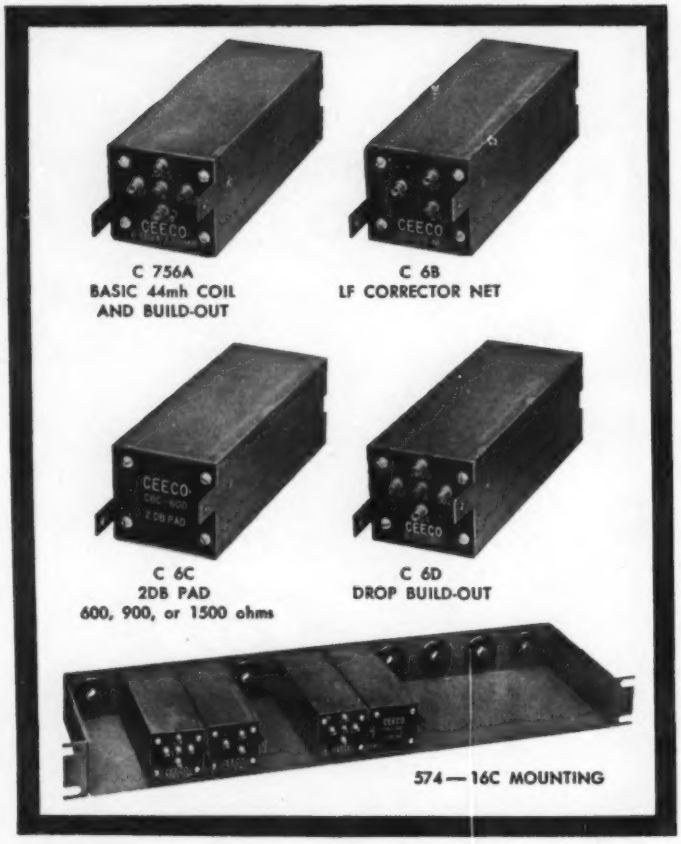
IMPEDANCE COMPENSATORS

CEECO impedance compensators and accessories are available for balancing lines and offices to meet VNL requirements. Plug-in construction provides flexible and economical application.



CEECO

With over 30 years experience, CEECO has extensive knowledge in the engineering and manufacture of telephone plant. Our skills and facilities are available to help you meet special requirements. Engineering inquiries are invited.

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lems which are not truly relevant to the exploitation of space.

No Propaganda Weapon

Satellite communication has already added to our prestige. But, satellite communication is no mere trick or weapon of propaganda. It promises substantial benefits to the citizens of all nations. It promises prompt, adequate and economical transoceanic telephony. Beyond this, it promises the immediacy of television, whether for the transmission of Olympic Games, music festivals, ballet, coronations, trade fairs, political speeches, or other activities.

All this can come to pass only step by step, through the solution of various problems.

Some of these are technical problems. We start with a first general idea. We proceed to a more particular idea of what can be accomplished and what practical advantages may be reaped. When the time is ripe, we invest the effort required to perform an experiment. In doing this we come upon new problems and we find how to solve the problems that we encounter.

Echo Just a Step

Satellite communication has successfully progressed to this stage in Echo I. A great deal of work has been done, and a great deal has been accomplished, but more lies ahead than lies behind. We must experiment with active satellites. In due time, we must develop and construct an operating satellite system.

Some of the problems which must be solved are not technological problems; they have to do with the assignment of radio frequencies to various uses, and with the ownership and operation of international communication facilities. Happily, such problems have been faced and solved before.

For satellite communication, in all its novelty, is but a part, an aspect, of the science and technology which we can easily and clearly trace back to Galileo. Thus, the Echo in our sky seems truly akin to the nymph whom Milton invoked as Queen of Parley. As a part of science and technology, international electrical communication has its own history, shorter but highly successful, and satellite communication could in its function be a powerful extension of a cooperative endeavor which is serving the world well. As such, satellites could give us immediate communication by television as well as by voice to all corners of the world.

Unhappily, satellite communication might be set apart from this broad sphere of established, cooperative, international endeavor as primarily either a bargaining point with our allies or a

YOUR CALENDAR OF

MICRO POWER "no-break" POWER EVENTS FOR 1961

..by UNITED STATES MOTORS CORPORATION

1ST QUARTER

New BRUSHLESS GENERATORS

U. S. Motors 5 to 20 kw capacity Micro Power units will feature new "brushless" generators to eliminate brush and slip ring maintenance requirements. The no-break units will also operate at plus or minus 1 per cent voltage regulation to satisfy increasing sensitivity of critical operating equipment.

2ND QUARTER

New 5 KW DIESEL MICRO POWER

5 KW capacity "diesel" Micro Power units will be available to fulfill growing demand for a thoroughly dependable power supply unit of smaller capacity.

3RD QUARTER

New LARGER SELECTION

The most complete selection of Micro Power units ever offered will be ready by the second half of '61. Included will be 1½-3 kw gas, or gasoline units — 5, 10, and 15 kw gas, gasoline, or diesel units — 20, 30, 50, 75, 100, 150, 200, and 300 kw capacity diesel units.

4TH QUARTER

New COMBINATION AC/DC UNITS

For the first time, combination AC/DC Micro Power units will be offered in 3 kw and larger capacities with 48 or 129 volt DC current for energizing transistorized microwave communications equipment, and 120/240 volt AC current for handling non-critical power needs.

GROWING STEADILY TO MEET YOUR MOST CRITICAL POWER REQUIREMENTS

1952
First Micro Power Unit.

1953
Intensified design and testing program initiated.

1954
First shipments of 3 KW gas, gasoline Micro Power.

1955
First shipments of 5 KW gas, gasoline Micro Power.

1956
First shipments of 10 KW gas, gasoline Micro Power.

1957
First diesel Micro Power Unit.

1958
Further expansion of research-testing program. First 50 KW Micro Power Unit unveiled.

1959
First shipments of 10 KW diesel Micro Power. 100 KW unit designed.

1960
Over 2000 units in operation. Larger capacities on the way.

authorized sales and service representatives in

CHICAGO, Ill. • DALLAS, Tex. • DENVER, Colo. • DETROIT, Mich. • JACKSONVILLE, Fla.
JERSEY CITY, N. J. • LOS ANGELES, Calif. • PORTLAND, Ore. • SAN FRANCISCO, Calif.

consult the classified section of your phone directory

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MICRO US POWER
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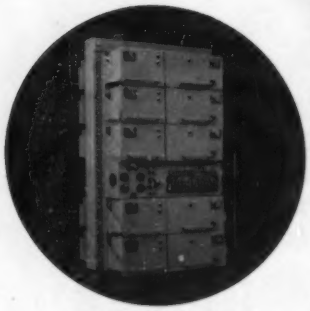
EXTRA PROFIT

WITH 1 TO 5 MORE
SUBSCRIBER CHANNELS
ON YOUR MULTI-PARTY PAIR

SUBSCRIBER CARRIER



Central office and pole-mounted installation are simple with the Lynch B 120

The Lynch B 120 Subscriber Carrier Telephone System offers these advantages:

Matches W. E. frequency allocations ■ Single Sideband, suppressed carrier for 15 to 23 db superiority in signal-to-noise ratio ■ Can duplicate any system of subscriber signaling ■ The vacuum tube circuitry of existing pole mounted terminal installations, is permitting operation under ambient temperatures of from −50° F to 120° F. ■ Easy to install, rugged, of proven high quality ■ Available with a complete line of standard-mounting, off-the-shelf line treatment equipment ■ Easy, economical means of expanding subscriber service.

Lynch

Distributors throughout the world

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propaganda weapon. This would scarcely accord with Milton's wish of giving resounding grace to all Heaven's harmonies.

New York Bell Provides Hookup for Wintering Ships

There's nothing like a party line to break up the monotony of a long winter of virtual isolation. And for shipkeepers aboard five Cleveland-Cliffs Iron Co. vessels moored near the breakwall in Buffalo (N. Y.) Harbor, telephone wires draped from the deck of one vessel to another will provide instant communication between them, and with the land in the event of emergency.

The Buffalo District office, U.S. Army Corps. of Engineers, sent Cleveland-Cliffs' headquarters in Cleveland a permit to run a temporary telephone cable on the bottom of the harbor, from Municipal Pier to the 604-foot Champlain at anchor about 1200 feet from the breakwall. The Champlain is the biggest of several Cleveland-Cliffs ore carriers wintering in Buffalo.

In its application for the special cable, Cleveland-Cliffs said it would establish a "party line above the surface between the ships."

Radio-telephone communication for these parts ends when the navigation season closes, with closedown of radio station WBL, North Tonawanda, N. Y.

The land-to-vessel connection was completed when New York Telephone Co. linemen ran wires to the municipal pier and connected them to a cable laid by American Shipbuilding Co. workmen, a New York Telephone spokesman said. Then telephone personnel connected the cable to a telephone aboard ship.

The hookup will provide quick emergency communication and a telephone connection with the company's Cleveland headquarters, for the Champlain and four other ships.

Evil of Procrastination

"He who waits to do a great deal of good at once, will never do anything."
—SAMUEL JOHNSON.

C P

GIVE
JAN. 15

HELP FIGHT
CEREBRAL PALSY

Corvan features 1,800-lb. load capacity!

CHEVY'S CORVAIR 95 TRUCKS

DRIVER'S UP FRONT... ENGINE'S IN THE REAR AND ALL THE REST IS WORK SPACE!

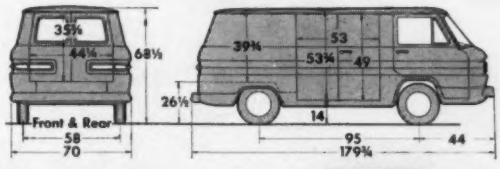
■ Open a Corvan's wide double doors and see how easily that load compartment can be adapted to your type of utility operation. There's ideal work space for installation, repair or cable splicing equipment. Enough capacity to hold 1,800 lbs. of tools and materials in an area that's 120″ long, 58.6″ wide and 53.7″ high at the center! That's more space than you get in a half-ton panel, and it's more accessible, too. Opens from the right side *and* the rear, with additional left-side doors available at extra cost.

■ Open the engine compartment in the rear and you'll see where this one does its saving. That thrifty air-cooled power plant never uses water or antifreeze; never requires new hose connections or radiator repairs. You can count on quick warmup, too.

■ Could be one of the Corvair 95 pickups would work even better on your operation. Like the Corvan, they have 4-wheel independent suspension, one-piece body-frame construction and a highly maneuverable 95-inch wheelbase. Talk to your dealer—choose the model that fits your specific fleet needs. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

SPECIFICATIONS

AXLE, REAR: ratio 3.89. **BRAKES:** hydraulic, front and rear 11″ x 2″; lining area 167 sq. in. **CLUTCH:** 9⅛″ dia. **DIRECTIONAL SIGNALS:** front and rear. **ENGINE:** Turbo-Air Six; 80 hp; 145-cu.-in. displacement. **FUEL TANK:** capacity 18½ gallons. **GVW:** 4,600-lb. maximum. **SPRINGS:** coil, front and rear, each with 1,150-lb. capacity. **STEERING:** ball-gear, ratio 20:1. **SUSPENSION:** independent front and rear, each with 2,500-lb. capacity. **TIRES:** five tubeless 7.00-14/4PR. **TRANSMISSION:** 3-speed synchro-mesh. **WINDSHIELD WIPERS:** dual electric; single speed. **EXTRA-COST OPTIONS** include Powerglide or 4-speed synchro-mesh transmission; a choice of 14 two-tone color combinations; plus dealer installed comfort and convenience features.



A NATURAL FOR FLEET DUTY!

CHEVROLET

"Super-Splice"®
makes splices
waterproof
...from
inside out!

Superior Cable's exclusive economical "Super-Splice" is a plastic splice sleeve. It is sealed at one end and comes to you filled with an insulating and waterproofing compound.*

"Super-Splice" prevents leakage currents and breakdowns in the presence of moisture . . . good for 25,000 v. d. c.

Can be easily removed to re-enter the splice . . . the compound never hardens or oozes out no matter what the temperature.

*A Dow-Corning silicone compound.

"Super-Splice" is available for use with straight, butt or bridge splices.

For further information on economical "SUPER-SPLICE", write

SUPERIOR CABLE
SUPERIOR CABLE CORPORATION
Hickory, North Carolina

News on New Products

CABLED LOOP ON DEAD-ENDS — Effective January, 1961, Preformed Line Products Co., will furnish as standard the Cabled Loop design on all popular sizes of its Guy-Grip dead-ends, according to an announcement by E. H. Brown, vice president-sales.

The Preformed Cabled Loop Guy-Grip dead-end, used at the top, breaker, and anchor rod, will be produced in a range of materials featuring galvanized steel, Alumoweld and Copperweld.

The Cabled Loop is durable, Preformed points out. Its smooth contour permits the loop to seat perfectly in the groove of the hardware. Cabled Loop Guy-Grip dead-ends are capable of holding the full-rated breaking strength of the strand to which they are applied.

According to the company, a major feature of the Cabled Loop Guy-Grip dead-end is easy tensioning when installing single or multiple guys. Retensioning, if ever required, is fast, safe and easy. Request NP1521.

•

NEW CAN FOR ALL-WEATHER ELECTRICAL TAPE—Continuing a practice established with "Scotch" brand electrical tape No. 33, Minnesota Mining & Mfg. Co. (3M) is packaging its new "Scotch" brand all-weather electrical tape No. 88 in metal cans.

The new can has the same basic design as the standard "Scotch" No. 33 container for ¾-inch-by-66-foot rolls, but is slightly larger to accommodate

the 20 per cent thicker, 8.5-mil all-weather tape.

For immediate recognition, the company states it has made the "bull's eye" on the new can dark green, in contrast to the traditional yellow center of the "Scotch" No. 33 can.

According to 3M, metal containers for plastic vinyl electrical tapes used in construction and maintenance offer several advantages to the user. The flat tins are designed for permanent storage of the tape and can be opened and closed easily for storing rolls when not in use, an advantage to maintenance and service crews who use tape intermittently. Designed with a tight fitting cover, the cans keep electrically conductive dust, dirt and lint off the tape edges. The strength of these metal containers protects tape from becoming misshapen and damaged when stored with heavy objects in tool boxes.

"Scotch" brand all-weather electrical tape No. 88 has been specially designed for cold weather application, yet re-

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St.
Chicago 5, Ill.

Please have the manufacturer send me without obligation the literature indicated by the following numbers:

NP1521_____; NP1522_____; NP1523_____; NP1524_____;

NP1525_____; NP1526_____.

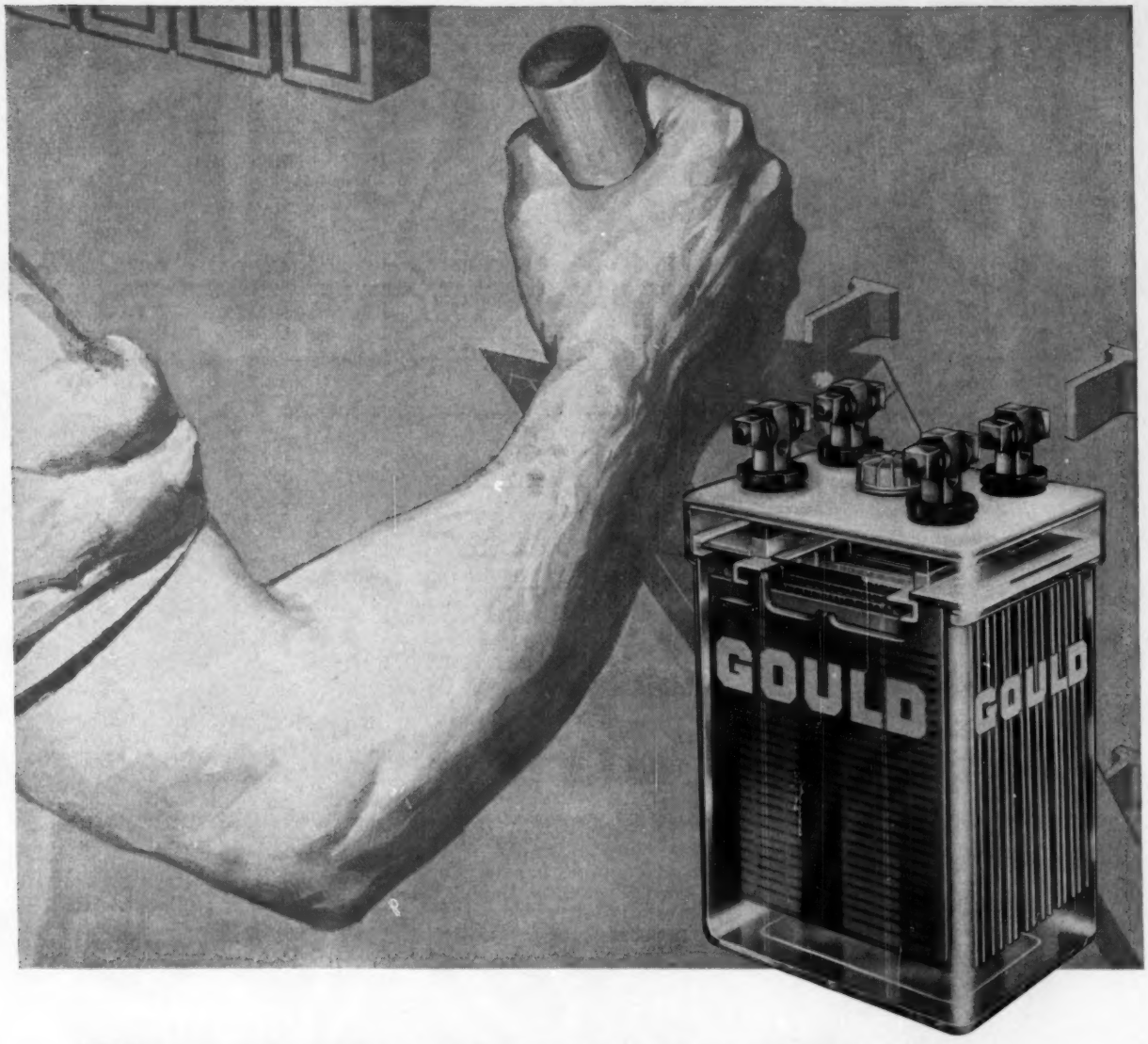
Name.....

Company.....

Street.....

Town and State.....

1/14/61



Big power when you need it...

GOULD Stationary Batteries

In emergencies—when quick, reliable current is needed for longer than a moment—new Gould Stationary Batteries in Plastrite Jars offer long, trouble-free service either full float or cycle operation.

Dependable power through proper design. New Silicone O-Ring post seal expands under compression, prevents escape of electrolyte. New stronger posts assure full current-carrying capacity with maximum voltage. Improved element suspension eliminates cover breakage due to weight of battery element.

Greater Power per square inch. Gould's new Stationary Batteries in Plastrite Jars save you 30-40% more floor space; this means you can increase your battery room capacity without increasing the room size. Lightweight Plastrite Jars have great impact resistance, are unharmed by normal handling and shipment.

Gould Stationary Batteries in Plastrite Jars are available in Planté, Calcium, or Kathanode. Write for details today, or call your local Gould office listed under "Batteries—Industrial" in the Yellow Pages. Gould-National Batteries, Inc., Trenton 7, N. J. In Canada, write to Gould-National Batteries of Canada, Ltd., 1819 Yonge Street, Toronto, Ont.

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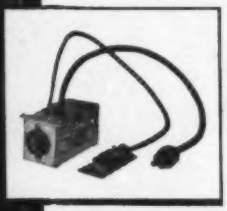
PRECISION
controls best

America calls 150,000 of these phone booths the warmest, brightest welcome anywhere at night.

Naturally, it's *automated light* . . . available only from Precision Multiple Controls. Miniaturized, fail-proof, a 2-component Precision photo-electric control will keep this bright voice in the night shining for years.

If you use light, it will serve you better — save you money — if it's *automated light* by Precision.



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Rugged, Low Cost Ditcher Digs 6"-14" Wide, 4½' Deep

This highly maneuverable 4T POW-R-DITCHER is only 46" wide . . . fast . . . and can handle most ditching jobs at a fraction of the cost of larger, more expensive units. The finest ditcher buy for low cost investment, low maintenance and high production.

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Please send me FREE information and prices on the complete Vermeer line of self-propelled POW-R-DITCHERS.

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1461 WASHINGTON • PELLA, IOWA

tains its handling and storage ability at summer temperatures, 3M states. At 0 degrees F., pliability, elongation, conformability and adhesion are comparable to regular plastic tapes at normal temperatures, while the same degree of resistance to atmospheric and chemical corrosion is maintained. Request NP-1522.

•

BURN-RELIEF SPRAY—A new addition to safety kits for industry and business is G-63, a fast-acting, effective aerosol spray for burns, General Scientific Equipment Co. has announced.

It is known that painful burns on the job, when not treated quickly and correctly, can result not only in time loss and production hold-ups, but can develop serious physical difficulties such as infection, permanent scarring, etc.

Packaged for industry in 8-ounce spray-on cans, G-63 is said to coat the skin instantly with a protective and invisible film that not only isolates the burn, but greatly speeds the healing process and provides immediately effective relief from pain. G-63 eliminates messy creams, and because of the soothing, protective film with which it coats instantly, it eliminates the need for bandages, as well.

G-63 reduces swelling, and General Scientific says it guards against secondary infection through the use of Hexachlorophene. Its pain-reducing agent is an analgesic agent. Request NP1523.

•

AUTOMATIC CALL HOLDER—Macson, Inc., is announcing the portable, all-transistorized, MS-513 Automatic Call Holder.

The MS-513 is designed to provide an artificial means of holding a switch train in an operated condition after the

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NOT just because Lindsay provides prompt delivery of nationally known supplies exactly as ordered... but also because of the friendly, personal way we do business, we think you'll like Lindsay. Try us and see!

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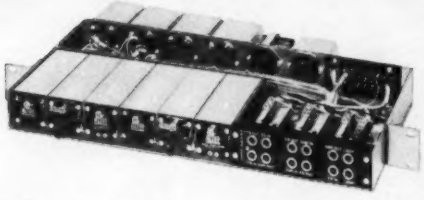
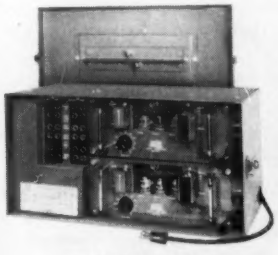
Call for ALTEC'S LINE of proven telephone equipment

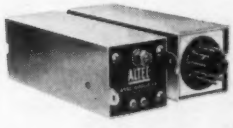


7300 Telephone Repeater Term Unit, fully complemented

Transistorized Repeater-Amplifier Terminating Equipment



S-17 Amplifier System



455A Amplifier

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CHECK YOUR NEEDS FROM THIS LIST

- 453A transistor type repeater amplifier for use on 24-26 volts.
- 455A transistor type repeater amplifier for 48-52 volts.
- 529 power supply designed to power 100 transistor type amplifiers from 110 volts AC.
- 533 power supply designed to power 1 transistor type amplifier from 110 AC. Contains bracket for amplifier.
- A series of equalizers for frequency correction for loaded, non-loaded, and open wire circuits.
- 460A transistor type compressor amplifier, interchangeable with 453-455 type.
- A series of brackets and trays to hold amplifiers and power supplies.
- 7300 telephone repeater panel which may be used for 2 wire-4 wire, 2 wire-2 wire, or 4 wire-4 wire applications, and is equipped with test circuit jacks and accommodates the following plug-in items on standard 19" relay rack—1 rack unit of 1¾" height:
  - Transistor type amplifiers
  - Frequency correction equalizers
  - Hybrid coils
  - Compromise and precision balancing network
  - Relay for loss pad relay switching
  - 4-wire loop back relay for routine testing
  - Repeat coils for simplex or composite signaling
- S-17 program amplifier, best quality amplifier for program circuits.
- A series of microphones, amplifiers, loudspeakers for PA systems.
- A series of hybrid and repeating coils.

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Just a few years ago, decay in the interior of a pole at the groundline area was considered a pretty hopeless case. Today, Osmose is saving many thousands of these afflicted poles with its exclusive Hollow Heart Treatment.

After boring, a specially designed Shell Thickness Indicator is used to evaluate the remaining wood strength in relation to the load. If the pole can be saved, the OSMOSE Hollow Heart treatment is applied. This consists of literally flooding cavities with a highly concentrated solution of toxic OSMOSALTS suspended in water. Decay is stopped in its tracks. Your poles remain sound for years and years more of safe, money-saving service.

Discover the full story of the OSMOSE program for groundline inspection and treatment. Write Osmose Wood Preserving Co. of America, Inc., 976 Ellicott Street, Buffalo 9, N. Y.

Osmose®

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calling party hangs up, for tracing nuisance calls, bomb threats, etc.

The MS-513 operates on a tone provided by the Macson 37AO oscillator. The tone is injected into one of 10 amplifier, detector and relay stages connected to the connector switches located in the telephone central office. By injecting a tone at the subscriber's station, ground is applied to the "C" lead on the connector switch and the switch train is held in an operated condition to allow the telephone company personnel sufficient time to make a complete trace of the call.

The MS-513 may be used in a manual office or in inter-office application using wire, carrier or microwave. Request NP1524.

•

PLASTIC WIRE TIES AND CABLE CLAMPS—A complete new line of plastic wire tires and cable clamps has just been announced by Nylogrip Products.

The company states Nylogrip Polyethylene Wire Ties combine strength, durability, and simplicity of application in bundling groups of wire and similar harness applications.

The ties are easily removed to speed repair, or to add more wires without disturbing the tie or the group of wires, the company reports. Nylogrip's wire ties, made from Du Pont's Nylon Zytel 101 or high dielectric polyethylene, are chemically inert and heat resistant. Breaking points range from 45-95 pounds. They are available in the 4-inch length in red, blue, and yellow, for color coding.

The company states that rugged nylon Zytel 101 also plays an important role in Nylogrip's new nylon cable clamps — lightweight, chemically resistant cable clamps combining toughness with excellent electrical properties and shock resistance. They are effective at a temperature range of 300°F to —60°F.

Nylogrip is also offering a complete line of ethyl cellulose cable clamps, featuring properties similar to those of nylon clamps, except that 1) price is lower and 2) the effective temperature

WHAT'S NEW AT

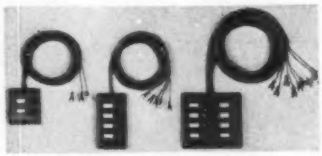
SUTTLE

NEW PUSHBUTTON SERIES

for extra subscriber sales!

SE554 SE559 SE561 SE565

For use in any audible signalling system, intercom use, or other office and shop subscriber use, SUTTLE pushbuttons answer all requirements. Lower in price than any others available, the housings are solid, executive type, blue-beige plastic. Cork base pads to prevent scratching are included with the SE559, SE561, and SE565. Used with the new SUTTLE Se-7 buzzer series or others. Write for full detail and prices.



SE559W SE561W SE565W

The SE559, 2-button, SE561, 4-button, and SE565, 8-button, are available with a 6′ 22 gauge flexible cord, pre-wired. Screw terminals with screws are provided with each unit and cord tips are included. Designed for use at normal telephone, house or office voltages.

Write for full literature and prices.

SUTTLE EQUIPMENT CORP.

401 North 15th St., Lawrenceville, Ill.
Lawrenceville 782

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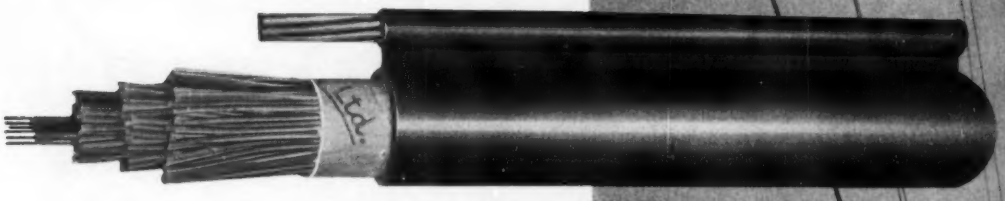
HITACHI

This is the Gourd-type cable — a new shape that contains a suspension strand, a communication line, and the answer to several problems!



This unique local or exchange area cable developed by Hitachi derives its distinctive "gourd shape" from the polyvinyl chloride sheathing that totally encloses the polyethylene-insulated communication line as well as its parallel suspension strand. It can be used in all the applications of conventional PE-insulated PVC sheathed cable and, in addition, is suitable for installation on steep grades where paper-insulated lead sheathed cable could not be used.

Another notable feature of the gourd-shaped cable is that it dispenses with the need for hangers, making installation easier, cheaper and faster. It can be installed close to buildings and power lines with complete safety (the suspension strand can be grounded to reduce electrostatic induction in the latter instance), retains high transmission qualities under the most trying weather conditions, and successfully withstands attack by salt or airborne chemicals.

Communication Equipments

Hitachi, Ltd.
Tokyo Japan
Cable Address: "HITACHY" TOKYO

More and more TELEPHONE COMPANIES

specify

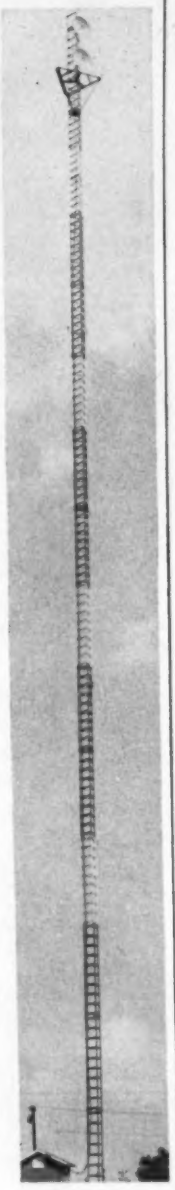
Stainless TOWERS

for

Economy

Simplicity

Reliability



300' Microwave Tower by Stainless, Inc.

Contact Stainless for self-supporting or guyed towers designed to meet your requirements.

Towers that stand up!

Ask today for your free booklet

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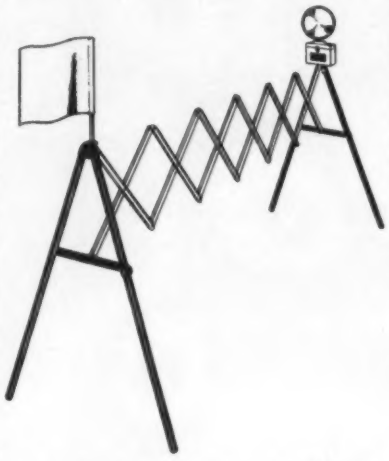
range is from 185°F to —40°F. Request NP1525.

•

GUARD-GATE BARRICADE—A new folding steel barricade, recently announced by Albert W. Pendergast Safety Equipment Co., should prove ideal for use in the communications field.



The barricade opens instantly to a full 8-foot width, yet folds to a compact 11 x 2½ x 36 inches. The company points out this is small enough to be carried in any type of vehicle; it weighs approximately 20 pounds (less flasher which is optional).

In addition, it is glass-beaded, reflectorized on traffic-yellow cross bars for maximum night-time visibility. The barricade is attractively finished in yellow and black enamel, the Pendergast company states. Also, it is furnished with two red fluorescent danger flags. Request NP1526.

Republic Creosoting Merges With Its Two Subsidiaries

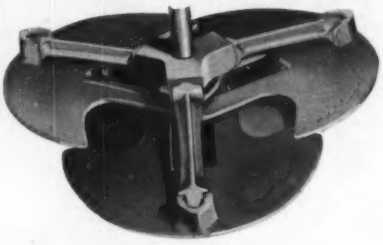
The Republic Creosoting Co., Indianapolis, has merged with its wholly-owned subsidiaries, Reilly Tar & Chemical Corp., and Char Products Co., effective Jan. 1, 1961.

The merged company is to be known as Reilly Tar & Chemical Corp. The wood preservation operations will be handled as a separate unit under the name Republic Creosoting Co., division of Reilly Tar & Chemical Corp.

Right for Right's Sake

"There are few, if any, absolutes in life, but surely a man or a nation does not do wrong when he behaves morally instead of expediently. The reward of doing what's right, just because it *is* right, is never immediate and obvious. This is as it should be. Otherwise, we might be acting to snatch the reward instead of honoring the principle."—HOLMES ALEXANDER, *Columnist.*

EXTRA Holding Power
QUICKLY Installed
TOUGH For long life



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For new construction and maintenance —Everstick Anchors speed up work and provide dependable anchorage on all types of jobs. Made of resilient, rust resistant malleable iron. The toughest anchors made. Write for bulletin.

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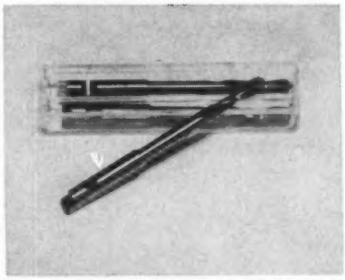
NOW AVAILABLE FOR THE FIRST TIME TO INDEPENDENT COMPANIES

DRILL POINTS
for
Yankee Automatic Drills



No. 30 (.1285) and No. 33 (.1130)

OVER ONE MILLION SOLD TO BELL COMPANIES

High Quality Steel Drill Points manufactured in Denmark's largest Twist Drill Plant.

Packed two to the plastic box

$15.00 PER PACKAGE OF 72 PIECES

(MINIMUM ORDER)

Either Size — No Mixtures
Postpaid anywhere in the U. S. A.

JOS. A. BATLLE & CO., Inc.

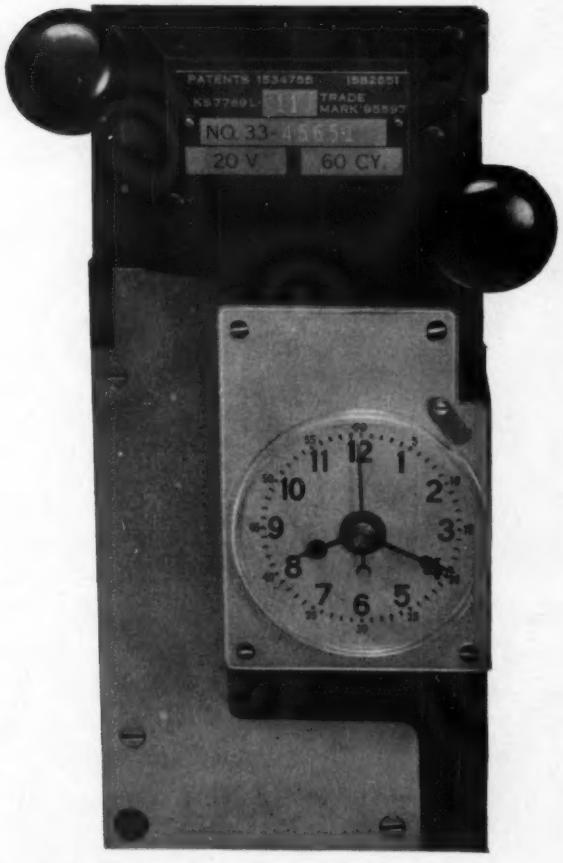
MANHASSET NEW YORK

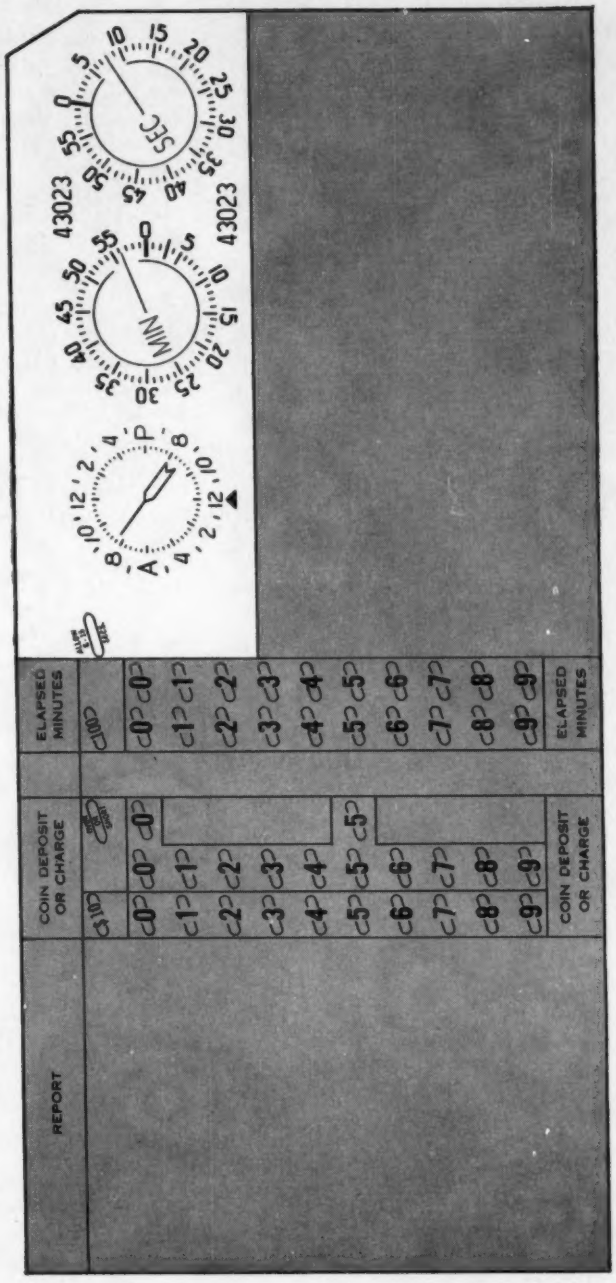
CALCULAGRAPH IS READY FOR MARK SENSING NOW!

If you are planning to use mark sense toll tickets now (or later) be sure your Calculagraphs are readily adaptable. Remember to do these three things now —

1. When ordering new Calculagraphs specify "set back" handles—this feature clears the way for mark sense toll tickets (or ANY SIZE ticket in fact).
2. Plan a program of modification of Calculagraphs now on your switchboard.
3. If you are still using the old round-type Calculagraphs, consider the economics of replacing them with the new space-saving Model 33 that will include all the latest improvements—set back handle, color-coded handles for easier operation and 60-minute dial to assure 100% accuracy on all calls.

If your analysis shows that mark sensing makes sense economically, or your present system requires a larger size ticket, consult your Calculagraph distributor today. Ask him about the set back handle feature as well as other modernization features of the NEW Calculagraph.





CALCULAGRAPH Company

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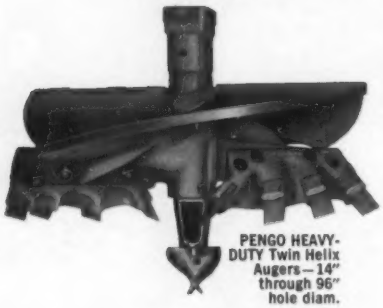
Manufacturers of Elapsed Time Recorders for over 65 years

PENGO AUGERS

Save you money 4 ways



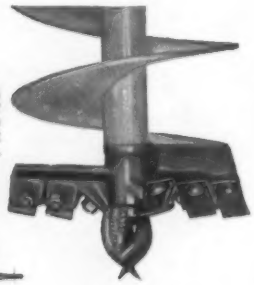
PENGO HEAVY-DUTY Twin Helix Augers—14" through 96" hole diam.

1 **BORE FASTER**...put real "teeth" in earth drilling, save wear and tear on your diggers.

2 **STAY ON THE JOB LONGER** ...all wearing parts replaceable in the field; no down-time for shop welding.

3 **COST FAR LESS TO MAINTAIN** ...reversible teeth cost only 90¢ each, pilot bit only $8.00. Parts interchangeable on all PENGO augers you are using...less inventory!

4 **A SIZE AND TYPE FOR EVERY DRILLING JOB**



PENGO BORING HEADS for welding to your present auger flights.

PENGO FLIGHT AUGERS and ANCHOR AUGERS—6" through 36" diam.

IF IT'S AUGERS YOU WANT, WE HAVE 'EM—JUST ASK US!

PENGO Augers and Boring Heads are available for all popular types of diggers, from light-duty post hole and farm tractor machines to the largest heavy-duty earth drills. Write today for free catalog; please address Dept. 108.

13-B

PETERSEN ENGINEERING CO., INC.
Santa Clara, California

Burfeind Retires After 61 Years of Service

Raymond H. Burfeind, veteran Independent telephone man, announced his retirement from active service on Jan. 1, after completing 61 years with the telephone industry. He will continue his residence at 1100 N. Dearborn St., Chicago, Ill.

Mr. Burfeind, affectionately called the "dean of Independent manufacturers' representatives," has become one of the best known and most popular figures in the telephone business through his many years of travel and attendance at national and state conventions.

Mr. Burfeind was born near Richton, Ill., the son of a Lutheran minister, and in 1895, moved with his parents to Chicago, where he attended high school.

After finishing high school, Mr. Burfeind joined Western Electric Co. on Oct. 1, 1899 and after four years with Western Electric and Kellogg Switchboard & Supply Co., he became associated with Automatic Electric Co. on Sept. 19, 1904, as equipment designer and engineer. During these early years, Mr. Burfeind furthered his general and engineering education by attending night schools.

For three years, he worked in the AE patent department and assisted in the design and development of automatic telephone equipment.

In 1907, he entered the equipment engineering department, and for seven years he remained in that work, assisting in the engineering of many important automatic exchanges in the United States.

In 1914, Mr. Burfeind was transferred to the Automatic Electric sales organization as district sales manager for private automatic exchanges. He was the originator of the idea of unattended automatic exchanges for rural communities, later to become known as C-A-X. In 1918, he was made C-A-X sales manager.

Mr. Burfeind, in 1921, was made assistant sales manager and was placed in charge of automatic central office equipment sales. From that time, until his retirement from Automatic Electric on Feb. 28, 1947, he represented that company in important sales negotiations.

On Dec. 10, 1942, Mr. Burfeind was honored as the ninth recipient of the Talbot G. Martin award for "his outstanding contributions to the art of telephone communication."

On Mar. 1, 1947, following his retirement from AE, Mr. Burfeind was elected vice president of the National Telephone Co., which owned and operated telephone properties in several states. Mr. Burfeind was in charge of the acquisition of telephone companies by National.

R. H. BURFEIND

A year later, on Apr. 1, 1948, Mr. Burfeind resigned from the National Telephone Co. to return to AE as assistant to the president of Automatic Electric Sales Corp. He remained with the sales corporation until May 1957, completing a total of 53 years of service with the AE organization.

From 1957 to Jan. 1 of this year, Mr. Burfeind has represented manufacturing and engineering firms in the telephone industry, which have included Gould-National Batteries, Inc., Henkels & McCoy, Lindsay Telephone Supply Co., Warren Mfg. Co. and S&G Mfg. Corp.

C. R. Fisher Is Stromberg Product Engineering Head

Charles R. Fisher has been appointed manager of product engineering for Stromberg-Carlson's telecommunication division, according to an announcement by Robert R. Dobbin, chief engineer.

In his new position, Mr. Fisher will be responsible for the development of all new products in the telephone instrument, toll ticketing and "XY" dial switching equipment lines. He formerly was manager of the digital communications laboratory in Stromberg-Carlson's research division.

Mr. Fisher joined Stromberg-Carlson in 1949 as a test engineer. Later he moved into circuit design engineering, where he worked on trunk circuits for nation-wide operator toll dialing. He also gained experience as a service engineer specializing in subscriber toll ticketing systems and wire chief's test equipment.

In 1956 he was appointed senior project engineer in charge of a Signal Corps contract calling for design and

desert-proven reliability

ACHIEVERFONE

AChieverfone by AC has been designed to give unfailing reliability despite extreme temperatures, vibration or amount of usage.

For example, the transmitter drivers and final are in a box cooled by a finned heat sink. This allows the transmitter to operate at about 18°C cooler than competitive models, thus extending operating life.

AChieverfone's design also includes special perforations in the R-T unit to permit convection cooling of the power supply in addition to radiation cooling. New, 7000-series tubes have been used wherever possible to guarantee the user longer tube life and a minimum of service problems even over rough terrain.

Reliability is just one outstanding feature of AChieverfone. Lowest initial cost and fast, easy installation are other reasons why you should consider this mobile radiotelephone above all others. It will pay your customers—it will pay you!

SPECIFICATIONS—FCC Type Accepted

Transmitter: 144-174 Mc, 4 Channel
RF output: 22.5 watts into 52 ohm load

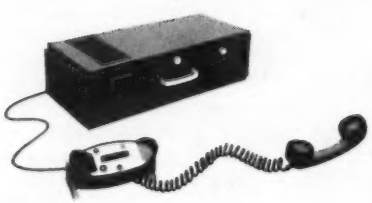
Receiver: 144-174 Mc, 4 Channel
Wide Band (60kc) or Narrow Band (30kc) models available (Wide Band quickly converted to narrow by substituting only I.F. filter)

Frequency Stability: within 0.0005%

Selective Signaling: 51,000 five-digit (compatible, 2-tone, sequential) codes available

Size: Receiver-Transmitter, 21⅛" x 8⅜" x 6¼"

Weight: 35.5 pounds, including receiver-transmitter, control head and interconnecting cable



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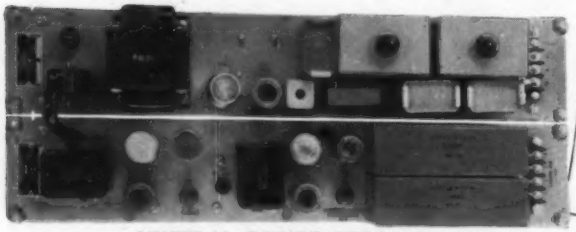

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development of basic circuits, such as core multiplexing, receiving communicator, and magnetic drum translator, for an electronic teletypewriter switching system. He transferred into the digital communications laboratory in 1958, and became manager of the laboratory in 1959.

In the latter capacity, he has been responsible for the development of terminal equipment for transmission of digital data at high speeds over telephone facilities, and a study of "store and forward" switching techniques with emphasis on traffic flow.

C. R. FISHER

Mr. Fisher earned his bachelor's degree in electrical engineering at Cornell University. He is a member of Tau Beta Pi, Eta Kappa Nu, Research Society of America, American Institute of Electrical Engineers, and the Association of American Railroads. He holds 11 patents, and has several additional patent applications pending.

Pyle Named Chief Electrical Engineer, Copperweld Steel

George Hamburger, manager of sales of Copperweld Steel Co.'s Wire & Cable division, has announced the promotion of Ralph D. Pyle to the position of chief electrical engineer. Mr. Pyle will make his headquarters at Glassport, Pa.

A graduate of Carnegie Institute of Technology in 1931, Mr. Pyle worked as a civilian employe for the U.S. Corps of Engineers in the Pittsburgh and Philadelphia districts until he joined Copperweld's engineering department in 1937. His work included supervision of the vibration laboratory for the study of electrical conductor performance.

He is a member of the American Institute of Electrical Engineers, American Society for Testing Materials, of

R. D. PYLE

the National Association of Corrosion Engineers, and of the Communication and Signal Section of the Association of American Railroads.

AE Sales to Hold Annual Conference Jan. 23-26

Over 150 communications products division representatives of Automatic Electric Sales will meet on Jan. 23 to 26, at O'Hare Inn, Des Plaines, Ill., for a general sales conference.

The four-day meeting is to be attended by all district managers, field and home office sales personnel and staff and operating engineers. It will be the first time that AE Sales has held its annual conference in an Independent telephone operating area. Des Plaines is served by Middle States Telephone Co.

The sessions are planned to provide sales personnel with information on the latest communications developments and techniques. Presentations include new products, Starlite telephone promotion and sales, transmission packages, supply sales, financing, and systems sales. The agenda also includes reports from engineering, production, installation, and advertising.

In addition to general meetings, specialized sessions on salesmanship will be presented through case histories and panel discussions.

A highlight on the agenda will be a sales training seminar conducted by Cyril Wright, sales training consultant from San Francisco. Mr. Wright will present a sales program related to the products of Automatic Electric.

The highlight of the Jan. 25 session will be a panel discussion by three executives from three Independent telephone companies.

Harry Hammond, chief engineer of Southwestern States Telephone Co.,

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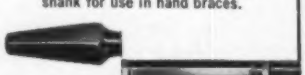
New Irwin Pole-Bor bits come in 12″, 18″ and 24″ lengths, with 8″, 12″ and 18″ twists. Sizes range from 9/16″ to 17/16″. Use these new Irwin bits for just about any job — whether boring crossarms, small, medium or extra large poles, heavy timbers. And remember: Irwin's patented Adapter Shank fits both hand braces and electric drills. Save time and money. Use fewer bits on the job. Get Irwin Pole-Bor non-stop boring action and extra safety, too. Order from your Irwin distributor today. The Irwin Auger Bit Company, Wilmington, Ohio.

Irwin Adapter Shank fits both hand braces and electric drills

Comes like this with taper square shank for use in hand braces.



Cut off taper square shank. Use in both hand braces and electric drills. No wobble, no run-out.

IRWIN Pole-Bor Bits

Brownwood, Tex.; Kenneth L. Schroeder, vice president of Northwestern Telephone Co., Freeport, Ill., and Fred S. Florance, general manager of Highland (N. Y.) Telephone Co. will present "The Telephone Man Speaks." This will pertain to what the operating telephone company expects of a telephone equipment supplier.

The conference concludes Jan. 26, with a staff engineers' meeting and meetings of special product groups.

U. S. Accepts North's Wright Brothers Sculptures

Dedication of a modern museum-visitors center and official acceptance of sculptures of the Wright brothers, America's pioneers of flight, took place on Dec. 17 at Kill Devil Hills, N. C., site of the brothers' first flight. The sculptures of the brothers are a gift to the people of the United States by North Electric Co.

The Dec. 17 ceremony took place on the 57th anniversary of the first successful powered flight and is an annual celebration jointly sponsored by the National Park Service, Kill Devil Hills Memorial Society and the U. S. Air Force Association.

The sculptures of the brothers are emplaced at the base and main entrance of the 60-foot Wright Brothers Memorial shaft. They are mounted on granite pedestals to the left and right of the steps to the memorial's entrance and depict them in the costumes worn during the initial flight.

Representing North Electric Co. on the speakers stand was Adm. Fritz Gleim, retired, assistant to the president, who participated in the event in behalf of North's president, William Tucker, long-time patron of the arts and primarily responsible for the commissioning of the Wright sculptures. They were created by Oskar J. W. Hansen, Charlottesville, Va., world-famous sculptor, who has conceived other outstanding memorials, including "Liberty" — honoring the Victory at Yorktown—and the famous sculptures at Hoover Dam.

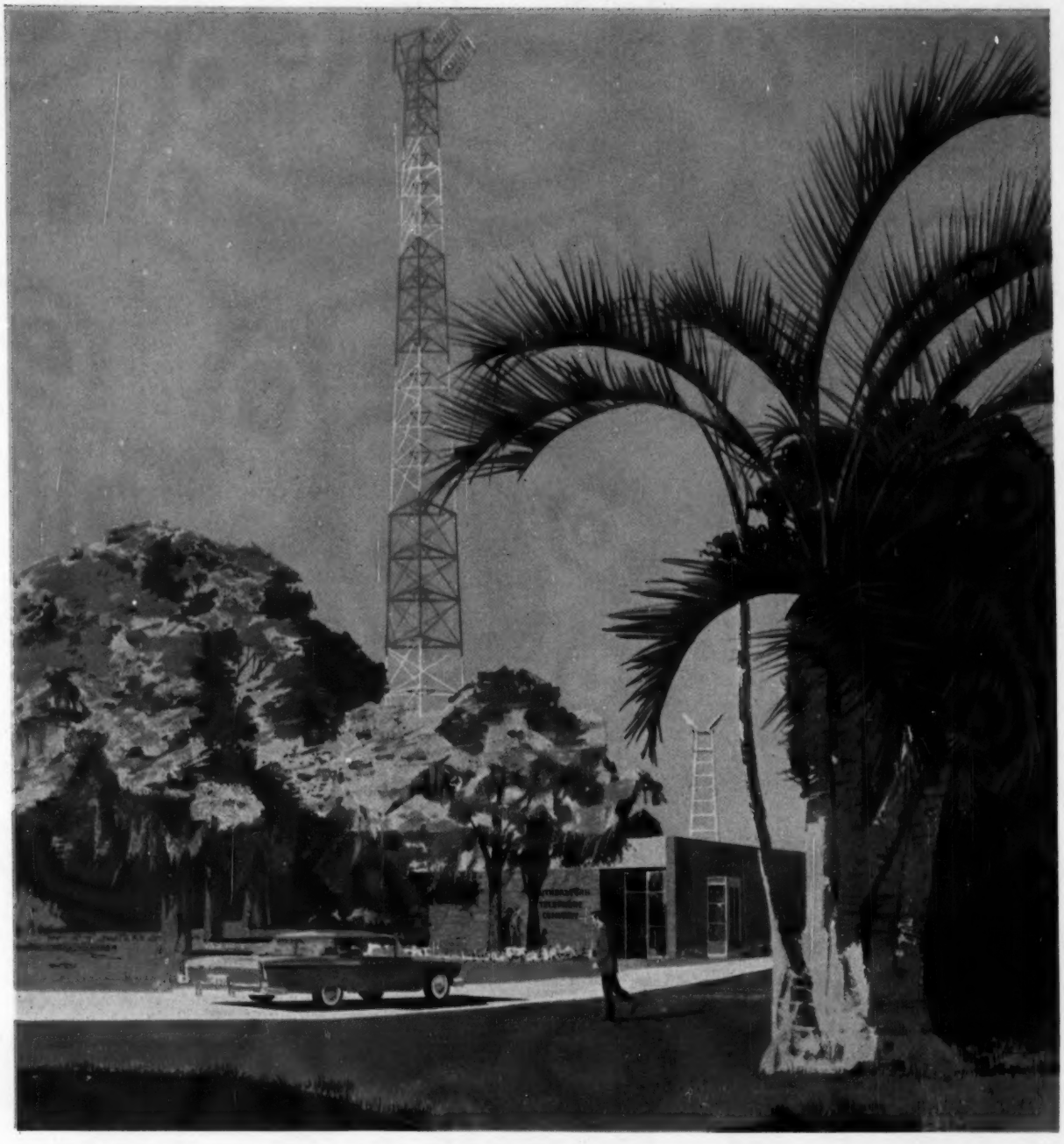
The roster of speakers for the 57th celebration included Gov. Luther Hodges of North Carolina; Conrad Wirth, director of the National Park Service; North Carolina Governor-elect Terry Sanford, Assistant Secretary of the Interior George W. Abbott and the keynote speaker, America's first military aviator, Maj. Gen. Benjamin D. Foulois, USAF, retired.

Precisely at 10:37 a.m., the exact time in 1903 of the Wright's momentous flight, sleek supersonic F105 Thunderchiefs paid a jet-age aerial tribute to the aviation pioneers with a flyover of the take-off site.

Ideal Then, Now

"Employment gives health, sobriety, and morals.—Constant employment and well-paid labor produce, in a country like ours, general prosperity, content, and cheerfulness."—DANIEL WEBSTER.

In Paris, France, North Electric Co.'s president, William Tucker (right), recently received the thanks of Gen. Robert Aubiniere, director of aeronautical-industrial techniques, for duplicates of the Wright brothers sculptures (shown at each side) presented to the people of France and the French Air Museum by North Electric Co. French interest in the Wrights stems from the fact that they used an engine made in France in their first airplane; early flights of the brothers in France, and France's contributions to the history of aviation.



***SOUTHEASTERN TELEPHONE COMPANY** expands with Collins L1-compatible carrier for direct toll system interconnection.*

Growing toll traffic from Florida's capital city area has led Southeastern Telephone Company to expand to 180 channels on its main toll outlet, a 26.4 mile Collins Microwave System between Tallahassee and Monticello, Fla. At Monticello, three super groups are fed directly at baseband frequencies into the Southern Bell TD-2 system. Direct compatibility of Collins Carrier with Western Electric L Carrier — both L1 and L3 allocations — eliminates back-to-back voice frequency equipment at the interconnect point. Southeastern is also enlarging its plant in West Florida with a new four station Collins Microwave and Carrier System providing special service voice and data circuits for Eglin Air Force Base. For consultation and assistance on your expansion program, contact Collins Radio Company, Texas Division Sales, 1930 Hi-Line Dr., Dallas 7, Texas.

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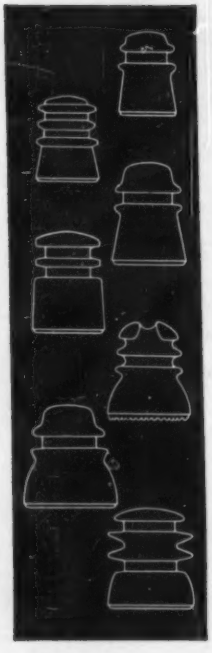

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IN THE NATION'S CAPITOL

Continued from page 18

the public, but said "we cannot conscientiously in good faith and in fairness to our customers agree to participate until provision for adequate compensation for use of property involved has been made."

General Telephone & Electronics Corp.'s Chairman, Donald C. Power, says that General Telephone approves the objectives of the new service. But, he said, "before our operating companies will be able to offer or participate in the new service, they and the Bell companies must reach an agreement which will provide our operating companies with a fair share of the revenues derived from the jointly rendered portion of the new service." The petitioning companies serve more than 4 million telephones in 31 states. Facilities of all Independent companies are directly or indirectly connected with the 62.9-million-telephone Bell System. The General Telephone petition said there is no effective method by which non-Bell companies can refuse to complete calls under the WATS proposal.

New AEC Boss?

The successor to John A. McCone, chairman of the AEC since 1958, was reported early this month as likely to be Dr. James B. Fisk, president of Bell Telephone Laboratories, according to sources close to President-elect Kennedy. Previously, Robert McKinney, New Mexico newspaper publisher, was thought to have the inside track. McKinney was said to be eager for the post and highly critical of the Eisenhower administration's atoms-for-peace program. Also, McKinney was close to Senator Anderson (D., N. M.), former chairman of the congressional Joint Committee on Atomic Energy.

Fisk was vice chairman of President Eisenhower's Science Advisory Committe, and in 1958 was chief U. S. delegate at the scientific conference on nuclear test detection held by the U. S., Great Britain, and the Soviet Union. He is also chairman of the Newark (N. J.) College of Engineering Research Foundation. Barring some unexpected development, Fisk, who is 50, appeared likely to get the call for the $22,500-a-year post as one of the most important non-Cabinet jobs in the federal government.

New FCC Toll Rate Reduction Brewing?

For some months now there have been indications that the Federal Communications Commission has been conferring with the Bell System informally on another reduction in interstate long-

distance tolls. These negotiations came to light early last year as a result of correspondence between the chairman of the House Judiciary Committee, Rep. Emanuel Celler (D., N. Y.), and the chairman of the FCC, Frederick W. Ford.

More recently, in a year-end statement issued on Jan. 1, Chairman Ford had occasion to refer very briefly to the status of so-called "common carriers" —meaning telephone and telegraph companies subject to the FCC's jurisdiction. There occurred in Chairman Ford's year-end statement the following very small but significant paragraph:

"The commission has followed closely the interstate earnings of the Bell System telephone companies. It has, during the past year, held a number of special meetings on the subject. *Moreover, it has scheduled a meeting early in 1961 to further consider whether any additional reduction in interstate telephone rates is warranted over and above the 50-million-dollar reduction effectuated in 1959.*" (Italics supplied.)

If this reference means anything at all, it clearly implies that the FCC and its staff are now busy with negotiations looking towards "additional reduction in interstate telephone rates." Whenever this occurs, and it has occurred several times in the past, the question of Independent company participation arises to plague the relationship of the Bell and the Independent branches of the telephone industry.

When the Celler-Ford correspondence came to light last year, the executive vice president of the United States Independent Telephone Association, Clyde S. Bailey, wrote to Chairman Ford pointing to the desirability of keeping the Independent companies advised of such matters and, preferably of permitting them to participate, at least to the extent of determining the effect on any such Independent company toll call compensation. Others have subsequently reminded the FCC and its staff about this. But so far there is no indication that the Independents have been or will be consulted until a rate reduction is agreed upon—if one is agreed upon.

Judging by Chairman Ford's brief reference, the timetable on this situation is getting rather short. He speaks of meetings "early in 1961." So if the Independents are going to be invited to join the party, or learn about what happens in any other form except via the newspapers, the invitations will have to go out pretty soon. There is a question here as to the responsibility of the staff of the FCC, as distinguished from the commission membership, in promulgating any future long-distance rate reduction as an ac-

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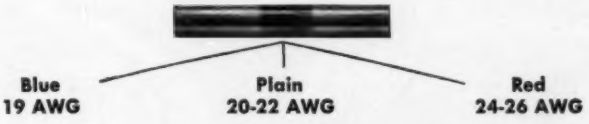

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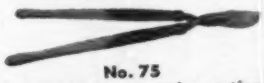

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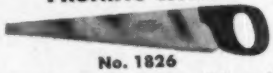

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complished fact. It is the staff which will have to defend a rate reduction in any ensuing litigation on the basis of inadequate toll division. And there will be such litigation if provision is not made for the Independents to their satisfaction.

Already, on the basis of present arrangements, the question of toll revenue division has been dragged into rate case litigation in four different states. This is an area of controversy likely to spread, in the event of a future interstate toll cut which the Independents may feel does not take care of their just requirements.

Will Wage Fixing Cost Jobs?

With all the forecasts of a prompt and decisive increase in the minimum wage under the Kennedy administration, some dissenting voices are beginning to be heard even on the Democratic side of the aisle. The objections are not so much to the proposed increase to a $1.25-an-hour minimum as they are to the *timing* of such legislation, during the current recession. Senator Fulbright (D., Ark.) has questioned whether an increase in the minimum and the broadening of the coverage at this time will not result in accelerating the inflationary spiral. Then, too, there is the argument that an increase in the minimum and a broadening of the coverage of the Fair Labor Standards Act may be self-defeating to the extent that it may actually cost jobs.

This is not to suggest that there is much likelihood that the long deferred minimum wage increase will be defeated or even deferred. The new President has gone very definitely on record that an increased minimum wage would be among the first items of business in the new administration, if he has his way about it. And he probably will have his way about it.

But, assuming that such will be the case, the January issue of *Nation's Business* points to a very thought-provoking survey, as to just what will happen when the new federal pay law becomes effective. This survey does not speculate or rationalize. It gives names and places of business concerns which have definitely stated they will reduce working forces by so many employes, rather than absorb increased operating costs which they feel they cannot afford.

In some cases, of course—and this may be true in the Independent telephone industry—alternative measures, such as automation of operation, will be stepped up. That also will result in immediate loss of some jobs in the case of work now being performed manually. Over the long run, of course, automation has always resulted in increasing

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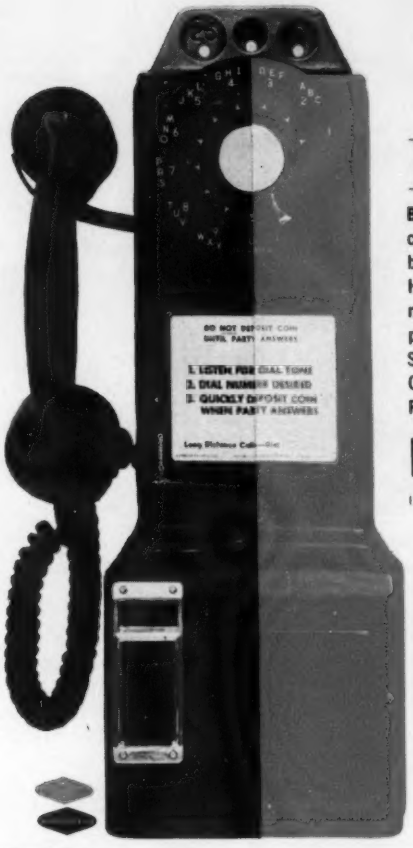

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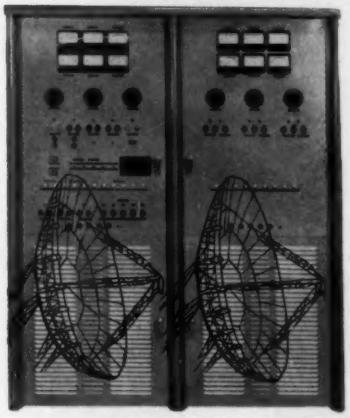

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employment, although changing the nature of the jobs involved — generally higher paying jobs have resulted.

The *Nation's Business* survey mentioned a Haverhill, Mass. department store which will fire 25 employes, mainly elderly workers. There is a cafeteria system in Macon, Ga., which must absorb increased wage costs of $600,000 a year. It will probably do so by a combination of layoffs and work-spreading arrangements. A Chattanooga, Tenn. laundry will either have to lay off workers or boost prices by 40 per cent, to stay in business. An Alabama lumber company will either have to discharge one-third of its work force or raise its prices 5 per cent to avoid operating at a loss.

Looking over the results of this survey, the most severe impact seems to be in retail establishments in small cities —department stores, variety stores, drug stores. Hotels, laundries, and similar local service establishments will feel the brunt under the provision of the proposed measure which would broaden the coverage by repealing exemptions now in effect. And, of course, there are the telephone operators' wages at small exchanges (of 750 stations or less) which are likely to be curtailed, if not wiped out. The importance of this exemption has been diminishing naturally over the past few years. But it is still important to some smaller companies. And its elimination will hasten the day when dial conversion will cut out a number of remaining manually-operated switchboard jobs.

What the administration will have to cope with as a result of these changes will be the problem of taking care of those laid off. They will not generally be highly skilled workers who can be shifted easily into other working forces. On the contrary, the very nature of the situation indicates that they would be marginal workers, to a large extent, low-paid, unskilled, elderly, or part-time employed people who could not readily find new work. If those who are laid off cannot find work elsewhere, it will mean that workers in low-wage communities will remain unemployed rather than obtain higher wages as a result of the higher minimum wage. So, alternative means of taking care of them on a welfare basis will have to be worked out. Thus, the second step in the chain of circumstances stemming from the original increase in the minimum will come into play. It will probably come to pass just that way unless the voices of those who urge caution receive more attention in the new administration than has been indicated so far.

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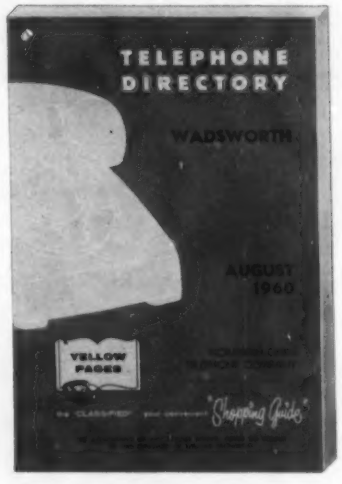

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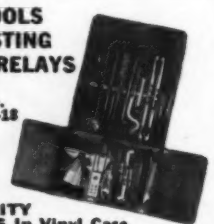

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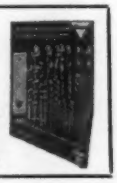

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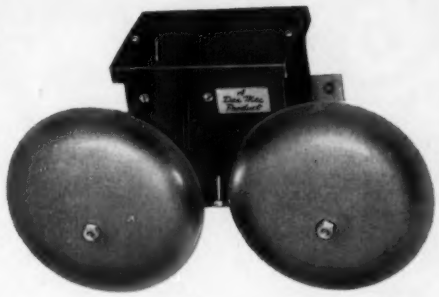

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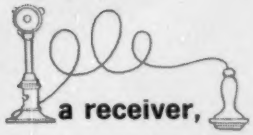
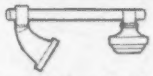


The first instruments had three parts...a transmitter, a receiver, and a signaling device. Each part was a unit, with only a cord connecting one to the other.

Then an engineer, begrudging the use of both hands to handle the phone, fastened the transmitter to one end of a length of broomstick and the receiver to the other,  just far enough apart so that, with one hand, he could bring the receiver to his ear and the transmitter to his mouth.

Others, seeing this innovation, were quick to recognize its advantages.

It naturally followed that some kind of a base or holder had to be designed to hold the phone, and eventually contain the ringer.

Thus was born the "cradle phone". Later, the dial was added to the base.

This basic "cradle phone" design dates back to the 1890's! And while technological improvements have improved transmission to almost perfect levels, the basic design of the telephone has remained virtually unchanged for nearly 70 years.

Corners have been rounded, new materials used, contours have been "streamlined", color has been added...but the cradle-handset concept is still the same.

There has been one notable exception...THE NORTH ERICOFON!

Some years ago, a searching question was asked, "Why cannot the components of the telephone, necessary to make a call, be designed into a one-piece instrument?" Discarding the old concept, a design group accepted this challenge. The transmitter, receiver, and dial were redesigned into a one-piece, upright free-form telephone, and even a revolutionary transistorized tone signaling device was incorporated.

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Bill is one of our "Revenue Men" in Long Beach, California.

After graduating from prep school in 1932, Bill went to work for a prominent New England manufacturing company. By 1942 he had become a department head. Then he joined the Marines, where he served as a machine gunner in the South Pacific and was awarded the Purple Heart.

In 1945, Bill returned to the states and decided to further his education. He entered Long Beach City College as an advertising major, and was elected president of his freshman, sophomore and junior classes.

It was in 1949 that Bill joined the General Telephone Directory Company as a sales representative in our Long Beach Division. In 1955 he was promoted to Sales Supervisor.

Bill makes his home in Long Beach with his wife and three children. Over the years he has devoted his time and talents to the Community Chest and the Toastmasters Club.

Bill Lyons is a good example of the "Revenue Men" who work for General Telephone Directory Company—and for you. Men who are an asset to any community in which they live.

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